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PARKING MANAGEMENT POLICIES AND AUTO CONTROL ZONES

METROPOLITAN WASHINGTON
COUNCIL OF GOVERNMENTS

PREPARED FOR
DEPARTMENT OF TRANSPORTATION

FEBRUARY 1976

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PARKING MANAGEMENT POLICIES AND AUTO CONTROL ZONES

Metropolitan Washington Council Of Governments
National Capital Region Transportation Planning Board

FEBRUARY 1976

SUMMARY REPORT

Prepared for
THE UNITED STATES
DEPARTMENT OF TRANSPORTATION
Office of the Secretary
Washington, D.C. 20590

OFFICE OF THE SECRETARY OF TRANSPORTATION
WASHINGTON, D.C. 20590

June 9, 1976

This Summary Report, Parking Management Policies and Auto Control Zones, was prepared by the Metropolitan Washington Council of Governments under contract to my office.

The objective of this study is to evaluate alternative parking management and auto control zone policies which, when combined with other transportation control measures, will help meet ambient air quality standards most efficiently with the least economic and social disruption.

Strategies analyzed include parking taxes, regulation of parking charges, residential parking permits, applying prevailing commercial rates to free and low cost parking, restricting the supply of parking spaces, and implementing auto control zones. Within the constraints of the state of knowledge and contract funding, the report identifies three alternative sets of strategies as effective in achieving the reduction in air pollutants assigned to parking management in the Clean Air Act State Implementation Plan for the District of Columbia.

Funds for this study were jointly provided by the U.S. Environmental Protection Agency (EPA) and the policy and environmental offices of the Office of the Secretary of Transportation. The contract advisory committee included representatives of the foregoing plus the Department's Urban Mass Transportation and Federal Highway Administrations.

While the contents of this report do not necessarily reflect the official views or policy of either the EPA or the Department of Transportation, I believe you will find of considerable interest the study approach and method, strategies identified, and parking/air quality relationships reported.

Judith T. Connor
Assistant Secretary for Environment,
Safety, and Consumer Affairs

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Introduction

The 1970 amendments to the Clean Air Act required the Environmental Protection Agency (EPA) to set national ambient air quality standards. Congress specified that a major part of the pollution abatement should result from the Federal Motor Vehicle Control Plan; however, in certain regions, additional measures were required to achieve the necessary reduction in air pollution. In December 1973, EPA promulgated the State Implementation Plan (SIP) to achieve the ambient standards, which included a Transportation Control Plan (TCP) for the National Capital Interstate Air Quality Control Region.[1/] The control plan proposed a 12 percent reduction in vehicle-miles-of-travel (VMT) in 1977 by the implementation of transit service improvements, a car pool locator service, an automobile retrofit program, an inspection and maintenance program, and the introduction of a series of parking policies, among others. The parking controls envisaged the elimination of free parking and the gradual imposition of a "transit incentive surcharge" on long-term parking spaces in certain areas of the National Capital Region. The surcharge was scheduled for phased implementation between 1975 and 1977. The SIP and TCP are detailed in Figure 1 (page 2).

As a result of the Energy Supply and Environmental Coordination Act of 1974 [2/], the Clean Air Act was amended to prohibit the requirement of a parking surcharge by the Administrator of the EPA. EPA revoked the parking surcharge element of the TCP in January, 1975. However, parking surcharges may still be implemented by local jurisdictions as a means to meet the 1977 air quality standards.

A recent decision by the U.S. Court of Appeals of the District of Columbia [3/] decided that EPA could not require the provision of the inspection and retrofit programs, but found the transit improvements element of the TCP valid. However, delays have been encountered in implementing key

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1/ See FR 12-6-73, pg. 33702.

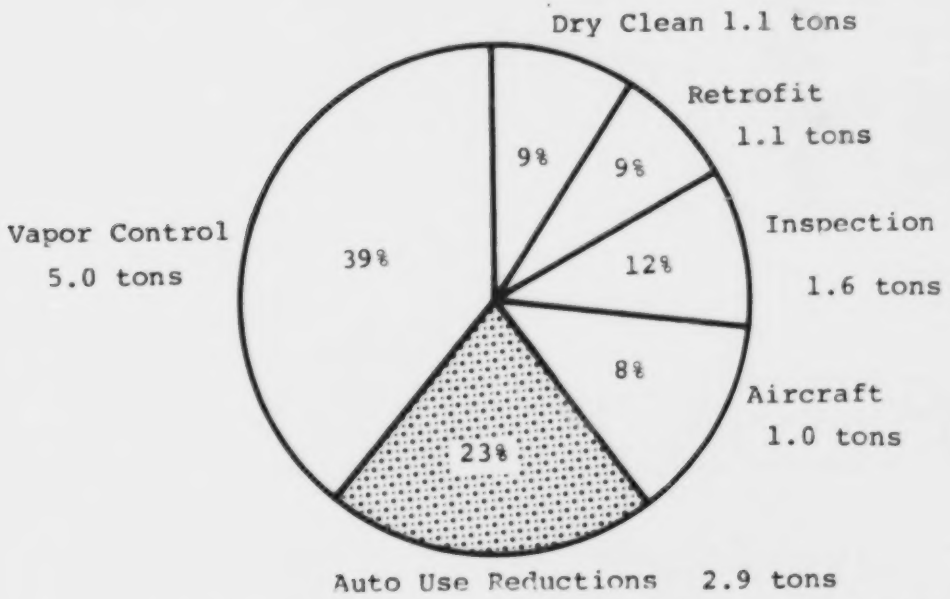
2/ Public Law 93-319 88 Stat 246, enacted June 26, 1974.

3/ District of Columbia et al. v. Train, Nos. 74-1013, 74-1575 and 74-1579 to 74-1582, October 28, 1975.

FIGURE 1: IMPLEMENTATION PLAN TO MEET 1977 AIR QUALITY STANDARDS

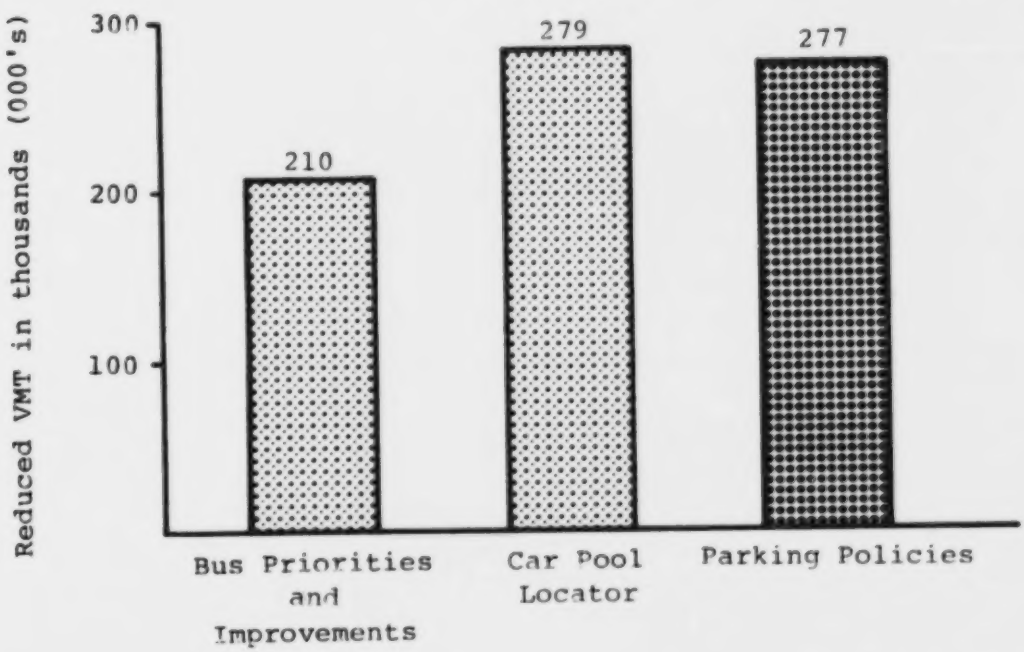
(PROMULGATED BY EPA, DECEMBER 1973)

Total Required Reductions in Hydrocarbon Emissions (12.7 tons)



Source: Federal Register, Volume 38, No. 234, Dec. 6, 1973

Total Required VMT Reductions for Auto Use
(766,000 VMT*)



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15. Supplementary Notes

16. Abstracts This report discusses the feasibilities and impacts of parking management programs and auto control zones as air quality strategies in the National Capital Region. Legal, institutional and administrative problems are examined for parking programs involving: parking taxes, rate regulation, residential parking permits, equitable rates for free and low cost parking, and parking supply restrictions. Any one of three parking programs would be effective in achieving parking management's share of the 12% VMT reduction set forth in the Clean Air Act State Implementation Plan (SIP) to achieve ambient air quality standards in 1977, providing implementation problems can be overcome. Implementation problems are more complex for supply restrictions than parking taxes. The $2 per day tax required in the SIP would increase prevailing commercial rates for long-term parking in the regional core by 75-100%. Auto control zones are likely to have a negligible impact on regional air quality in 1977, but have substantial air quality potential in a 3-10 year time frame.

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Metrorail and bus priority segments of the transit improvement program. The complete transit improvement program of the TCP will not be operational in 1977. These developments have led to Federal, state, and local efforts to develop a revised TCP.

The objective of the parking management policy phase of this study is to identify and discuss those policies which, when combined with other transportation control measures, will meet the ambient air quality standards most efficiently with the least economic and social disruption. Analysis focused on home-to-work travel to areas adequately served by transit, occurring during the weekday morning peak period. The promulgated implementation plan concentrated primarily on reducing hydrocarbon emissions during this period.

The objective of the auto control zone phase of this study is to examine the types of auto control zones applicable to the Washington core, while concentrating on the implementation issues and anticipated air quality and socio-economic impacts of auto control zones in the downtown retail core.

The transportation demand forecasting procedures used in the study are part of the ongoing planning program at the Metropolitan Washington Council of Governments National Capital Region Transportation Planning Board. The study also investigates the legal and institutional problems associated with the implementation of selected parking controls. Although the investigation is primarily geared toward anticipated problems in the Metropolitan Washington Area, this section of the report should prove useful to planners in other metropolitan regions of the United States.

In order to achieve the participation of jurisdictions and agencies having implementing responsibilities and public interest groups, a Technical Advisory Committee was formed. Primary responsibility of the Committee was to assist in the evaluation of alternate parking policies.

The first section of this report presents a summary of the study's conclusions, while the second section contains a parking characteristics inventory. Technical analyses of alternative parking policies are detailed in the third section. The implementation problems of parking programs, legal, institutional and administrative are then examined, followed by a discussion of social and economic impacts. Auto-control zones and their impacts are discussed in the last section.

Summary of Conclusions

The study examined four parking policy programs from technical, legal, institutional, and administrative perspectives. Three major questions were addressed: could the parking policy programs technically meet the 4.3 percent emission reductions assigned to these policies by the EPA promulgated Transportation Control Plan (TCP); what were the likely implementation problems, and what were the anticipated socio-economic impacts?

The following four parking programs were examined:

1. A pricing program involving application of prevailing commercial rates for free and low cost, long-term commuter parking (six or more hours) and a $2 per day surcharge on such parking.

2. A pricing program involving a substantial increase in fees for long term parking and the application of prevailing rates to free and low-cost commuter parking. Increases in parking fees would be achieved via rate regulation.

3. A supply restraint program involving on-street permit parking for local residents, other vehicles limited to two hours of on-street parking; the establishment of short-term only parking facilities and introduction of long-term parking quotas.

4. A combination pricing-supply program involving the application of prevailing rates for free and low-cost, long-term commuter parking, on-street parking permits for local residents, and a $1 per day surcharge.

Auxiliary techniques, involving strict enforcement of parking violations, prohibition of on-street metered parking prior to 10:00 a.m., and conversion of on-street reserved spaces to metered spaces were common to all four parking programs.

These programs were tested only in locations of the Washington Metropolitan Area that were projected to have adequate transit service in 1977. An area was designated as having adequate transit if 66 percent of the work trips to an area were within 45 minutes by transit. The areas satisfying this transit adequacy criterion were downtown Washington, (including Capitol Hill and the SW Mall), Rosslyn, the Pentagon, and downtown Silver Spring. (See Figure 2.)

AIR QUALITY IMPLICATIONS

This study has determined that the pricing and supply restraint parking programs (1, 2, and 3) are from a technical standpoint, capable of meeting the 1977 scheduled parking policy emission reductions, if applied in those areas adequately served by transit. The pricing programs would generate an emissions reduction of 0.83 tons of hydrocarbons during the 6:00-9:00 a.m. period, versus a 1977 requirement of 0.80 tons. The combination pricing/supply program (alternate four) would generate 90% of the required reductions.

SOCIO-ECONOMIC IMPACTS

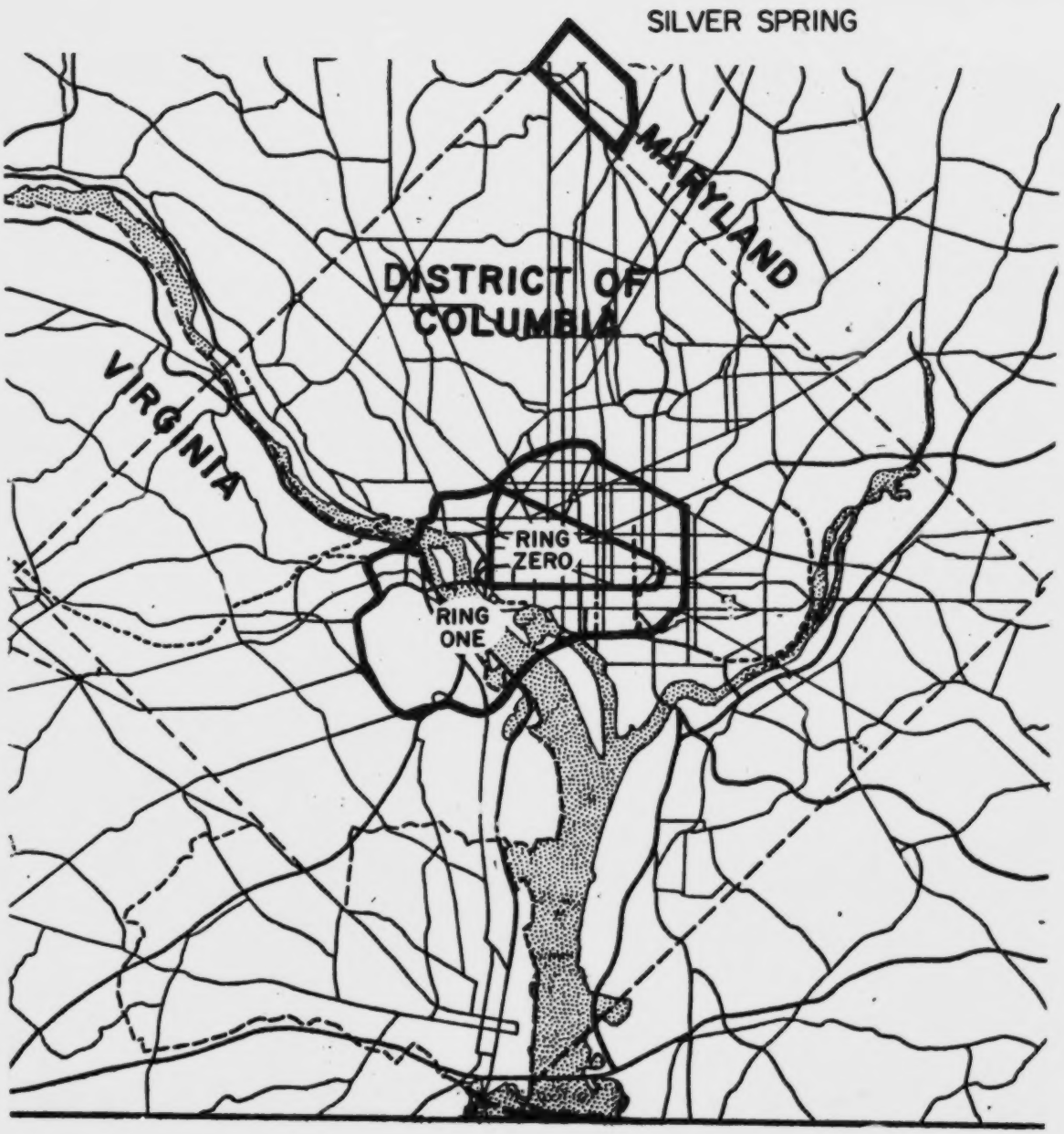
In addition to achieving better air quality, parking programs would help promote other community benefits. Approximately 34,000 home-to-work auto drivers would switch to other modes as a result of parking programs, resulting in a daily vehicle miles of travel reduction of 628,000 VMT. A travel reduction of approximately 270,000 VMT is projected for the 6:00-9:00 a.m. peak period. Such reduction in VMT would reduce peak period congestion. Lower accident rates and traffic noise levels are anticipated to be complementary positive impacts. A savings of 48,000 gallons of gasoline per average work day is also projected.

The parking programs are estimated to produce approximately 40,000 additional daily home-to-work transit riders on the expanded transit system projected for 1977. The planned 1977 transit system, including two METRO rapid rail routes and seven new bus priority corridors, will itself cause a reduction of 420,000 VMT daily, exclusive of the effect of parking programs. A $2 per day surcharge would produce approximately $32 million per year in revenues, while a $1 per day surcharge would produce $18 million. These revenues could potentially offer significant aid in financing transit operating improvements.

Certain negative socio-economic impacts can be expected from the implementation of any of the parking programs. Less-convenient work trips for drivers switching to transit and higher commuting costs for drivers who remain in their cars are included, as are the additional hardships imposed on

FIGURE 2

PARKING MANAGEMENT AREAS



drivers who must travel from work to school or personal business. Low income persons are likely to be most affected and therefore the provision of alternate public transportation services is important.

The magnitude of revenue loss to the commercial parking industry would depend on prevailing 1977 rate levels; these rate levels would be sensitive to a projected over-supply of long-term parking. In the downtown core (Ring 0), Figure 2, it is estimated the number of long-term commuters parking in commercial facilities would shrink from 34,000 commuters to 28,000, due to parking management programs.

It is expected that parking programs will increase the supply of short-term parking for shoppers and tourists and thus retail sales in impacted areas would be enhanced. This opportunity will be countered to the extent that higher parking rates or surcharges may discourage convenience trips to these areas.

Land values and employment levels in involved areas are potentially sensitive to parking policies. These impacts are strongly influenced by "growth" or "no growth" policies in suburban areas. An increase in the cost of conducting business downtown, for instance, could lead to long-term pressures for business to relocate in suburban areas.

IMPLEMENTATION PROBLEMS

Implementation problems for parking programs are shaped by institutional, legal, and administrative issues. Institutional issues are primarily political. All four parking programs can expect substantial political opposition. Support by Congress is of key importance, especially with regard to equitable parking rates for Federal employees. Congress could block the implementation of parking surcharges or supply restrictions, including residential parking permits in the District.

Surcharges

The study has concluded that there are no insurmountable legal problems involved in the implementation of a surcharge, but because of restrictions on fees collected from licenses, the surcharge should be levied in the form of an excise tax or a sales tax. Authorization to levy a surcharge in Virginia and Maryland must be obtained from the state governments via appropriate legislation. Administration of a surcharge would not necessitate the creation of a new body such as a parking authority, and low collection costs of less than five percent of total revenues are anticipated. The General Services Administration is a likely candidate for administration of a surcharge of federally-operated spaces, whereas, local revenue/finance departments should administer the surcharge for commercial/private facilities and local government parking.

In response to anticipated political opposition to parking surcharges, it should be noted that the use of excise taxes to make users pay the full cost of product consumption is entrenched in the United States tax system. A parking tax can be viewed as a mechanism for redressing the negative social and environmental costs resulting from an overly abundant supply of long-term parking.

Implementation of Prevailing Rates

Implementation of new rates for free parking is simplified administratively by the fact that most long-term free parking in the regional core is supplied by government for its employees. Administration of new rates could thus be coordinated with the surcharge implementation in the government sphere.

Private free parking accounts for less than 10 percent of the free long-term parking in areas such as Ring 0. Policies to force prevailing rates for this free parking are apt to encounter legal difficulties. In addition, the introduction of a rate regulation capacity would be needed and require the creation of a new regulatory body.

Residential Permit Systems

The study concluded that residential on-street permit systems are likely to withstand court review if implemented via carefully drafted enabling legislation which did not totally exclude non-resident parking. The District of Columbia and Montgomery County have passed legislation authorizing the implementation of residential permit areas, while Arlington County has a system in effect in the Crystal City area. Residential permit systems in the District can be expected to encounter opposition from suburban jurisdictions and commuters. A residential permit system for the Friend-

ship Heights area of D.C. was implemented in early 1976, and the Georgetown and Walter Reed areas are scheduled for permit operation in the summer of 1976.

A number of complex implementation problems would be encountered for residential permit systems, including the designation of area boundaries, registration and identification procedures and adequate enforcement. Because of these problems, residential permit systems could generate high administrative costs.

Rate Regulation/Supply Restrictions

Implementation of rate regulation and supply restriction parking techniques would encounter substantial legal and administrative problems. Because of these problems and the inability of these techniques to generate public revenues, this study has concluded that rate regulation/ supply restriction techniques are not readily acceptable replacements for new rates for free parking, parking taxes, and residential permit systems.

Rate regulation techniques involving higher monthly rates and the implementation of hourly flat rates in lieu of daily maximum rates encounter the following drawbacks:

- Rate regulation would necessitate the creation of a regulatory body capable of performing adjudicative, as well as administrative tasks. Precedents for this type of responsibility are not found in contemporary parking authorities in the United States.

- Rate regulation would tend to stifle competition in the commercial parking industry.

- The system would be inherently inflexible and not suitable for short-term adjustments in reponse to market or urban transportation conditions.

- It is not certain that courts would uphold such rate regulations, although none of the many arguments available against regulations are strong enough *per se* to compel invalidity.

- Revenues to offset administrative expenses and for other public purposes, including transit, would not be generated.

Supply restriction techniques, involving short-term parking-only facilities and short-term parking quotas, encounter the following problems:

- Large amounts of parking would have to be made unavailable to long-term parkers. In Ring 0, for example, approximately 60 percent of the total spaces available in 1974 for all types of parking would have to be denied to long-term parking to meet 1977 air quality standards.

- The administration of a supply restriction program would necessitate the creation of a regulatory body with powers in excess of those granted to contemporary American parking authorities.

- It is likely the courts will not accept such restrictions applied to existing commercial and private facilities, which conform to current zoning regulations.

- Planning for the location of long-term parking would be complex and involve equity questions between adjoining areas.

- Enforcement of long-term quotas would be difficult.

When considering the maintenance of reduced VMT levels over a longer time frame, certain forms of supply restrictions have the potential to be valuable elements of parking programs. Zoning restrictions on the construction of new parking are particularly valuable techniques over an extended period of time. The creation of a public authority to gradually acquire existing facilities and convert some of the facilities to short-term only parking, as part of a comprehensive areawide parking plan, also offers potential in the context of a five-ten year program.

Coordinated parking program planning requires that parking be integrated into the unified regional multi-modal transportation planning process. The specific interrelationships should be investigated as part of the development of a regional parking management plan. In addition, a procedure for updating parking inventory data on a periodic basis is needed as part of the process.

AUTO CONTROL ZONES

Auto control zones can help promote air quality in two distinct ways; first, by reducing regional hydrocarbon emissions by diverting automobile trips to other modes, and secondly, by reducing localized carbon monoxide pollution through removal of automobile traffic from pedestrian streets. Typically, auto control zones in the United States have involved removal of auto traffic from relatively few streets

and have not restricted access to existing long-term parking spaces.

Auto control zone planning for the Washington area has concentrated on F and G Streets between 5th and 15th Streets, N.W. Small pedestrian malls are currently under construction on the streets in the area of the National Portrait Gallery.

An F-G Streets auto control zone can be expected to significantly reduce local carbon monoxide levels for the involved blocks, in the range of 50%-75%, while providing a host of amenities for downtown residents, employees, and shoppers. Initial impacts on regional hydrocarbon pollution will be minimal since access will not be denied to long-term parking and changes in traffic flow patterns will be slight.

However, the establishment of a public body to gradually convert long-term parking spaces in the area of the auto control zone to short-term parking will result in a combination parking policy-auto control zone program. The time frame for such development is realistically five-to-ten years, and the potential for air quality improvement is substantial, as discussed below.

A much larger auto control zone than the F-G Streets Pedestrian Mall was studied: bounded by H Street, 3rd Street, Constitution Ave., and 15th Street (approximately 0.8 square miles). A zone of this magnitude could deny access to as many as 19,000 parking spaces and act as a supply restriction for long-term parking, depending on its internal traffic restrictions. Such a supply reduction could reduce 6:00-9:00 a.m. hydrocarbon emissions by up to approximately 0.35 tons (compared to 0.83 tons for the three rate increase/supply restriction programs).

In addition to the problems previously mentioned for supply restrictions, an auto control zone of this size would have the following problems:

- Some through trips would be diverted to alternate routes contributing to congestion problems. Longer through trips could erode some air quality gains of the zone. Congestion and air quality impact would be minimized by the compact nature of the zone and the provision of some arterial routes through the zone.
- Depending on the nature of internal auto restrictions, access to short-term parking spaces could be reduced.

- A zone of this size would entail a major downtown redevelopment program with implementation and administrative problems far more complex than those encountered in parking programs: high initial implementation costs (perhaps exceeding $50 million), provision of services and maintenance in the zone, and potential difficulties in the delivery of goods services.

Despite these problems, a large auto control zone could support improved air quality goals, but would need to be implemented in the context of wider redevelopment. This type of implementation is more realistic in a 5-10 year time frame. As the auto free zone gradually increased in scale, a public parking agency could acquire and operate parking spaces to the benefit of the short-term parker.

IMPLEMENTATION TIMING CONSIDERATIONS

Parking programs involving equitable rates for free and low cost parking and the implementation of moderate parking taxes are candidates for short term implementation from administrative and legal perspectives, as are residential permit techniques. These strategies have, however, encountered institutional opposition from Congress, local governments, affected commuters, and some segments of the business community. The potential of these techniques for raising revenues for public transportation or other applications may help resolve some of the institutional opposition, and thus such programs offer potential in a 1976-1977 framework. Parking rate regulations and parking supply restrictions face legal uncertainties and complex administrative difficulties, and would require the existence of a regulatory body at the local and/or regional levels. These techniques are not considered feasible for implementation in 1976-1977.

Auto control zones can provide substantial localized relief from carbon monoxide pollution in 1977. The potential for regional hydrocarbon reductions is directly related to parking programs implemented in conjunction with the zones, and appropriate traffic engineering techniques to deal with through travel. Pedestrian malls scheduled for 1977 operation in the regional core will have negligible effect on limiting commuter parking and enhancing short-term parking for shoppers and tourists. The implementation of larger auto control zones including coordinated parking and traffic engineering programs offers potential in a 3-10 year time frame.

An improved transit system, capable of adequately serving auto drivers diverted to public transportation by parking programs able to meet air quality requirements, will not be fully operational in 1977, including Metrorail service to Silver Spring. Full implementation of these parking programs in 1977 would cause significant economic and social disruptions in the absence of a fully adequate transit alternative. In addition, adjustments to the Air Quality SIP will be necessitated by the recent court decision on inspection and retrofit programs, and by continuing changes in the implementation status of other SIP elements.

POTENTIAL OPTIONS FOR IMPLEMENTATION

Based on the results of this research study, a number of potential options for parking management implementation can be identified. These options are intended for further consideration in the ongoing joint air quality/transportation study administered by COG and the unified comprehensive urban transportation planning process for the National Capital Region under the coordination of the TPB and COG.

1. The role, extent, and content of parking management programs should be updated on a continuing basis and reflect revisions to the SIP.

2. Selective elements of the parking management programs discussed in this report could be implemented in 1976 and 1977. Early implementation elements could include: strict enforcement of parking violations, equitable commercial rates for free and low cost parking provided to government employees (The National Capital Region Transportation Planning Board passed a resolution calling for equitable Federal employee parking rates on December 17, 1975), residential permit parking techniques, parking taxes on long-term parking not to exceed 50 cents per day.

3. Revenues from increased Federal parking rates and from parking taxes should be used to improve and support public transportation whenever possible.

4. Parking program elements should be implemented in conjunction with Metrorail phases as they become operational, and with bus priority and carpool

improvements. Parking programs should not be confined to the Regional Core and Silver Spring, but should be implemented in additional areas of the Washington metropolitan region as the areas receive improved public transportation including Metrorail service.

5. A 5-year Regional Parking Management Program should be developed and periodically updated in conjunction with Metrorail phases and revisions in the Air Quality SIP. The Program should be coordinated with the Short-Range Transportation Improvement Program for the Washington Metropolitan Area. The Plan should include a fringe parking element.

6. An auto control zone in a pedestrian mall format could be initiated in 1976 on F and G Streets in the downtown retail core. A parking program providing adequate short-term parking and controls on long-term parking could be developed and implemented in conjunction with this auto control zone. Planning efforts for expanded auto control zones and associated parking management programs should be expanded with a view toward implementation in a 3-10 year time frame.

Parking Inventory

A parking inventory for the program areas was compiled by using data supplied by local jurisdictions, supplemented by project field surveys.

PARKING SUPPLY IN THE DOWNTOWN CBD

Table 1 presents a comparison of the total number of parking spaces available in the downtown central business district (Ring 0) for the years 1968 and 1974.

TABLE 1

CHANGE IN PARKING SUPPLY IN THE WASHINGTON CBD (Ring 0)
1968-1974

TYPE OF SPACE	1968	1974	Total Change	Percentage Change
On-Street	5,232	4,608	-624	-12
Parking Lots [1)]	22,745	18,426	-4,319	-19
Parking Garages [1)]	25,114	38,231	+13,117	+52
Government Lots and Garages [2)]	7,942	13,355	+5,413	+68
Other	1,053	1,739	+686	+65
Total	62,086	76,359	+14,273	+23

1) = not including government facilities.
2) = Federal and local

SOURCE: Metropolitan Washington Council of Governments, supplemented by District of Columbia Department of Highways and Traffic, Parking Division.

The 23 percent growth in parking spaces in the downtown CBD, between 1968 and 1974, can be attributed to large increases in commercial and private garages and government facility spaces. Conversely, the total number of on-street and parking lot spaces have declined.

PARKING CHARACTERISTICS OF STUDY AREAS

Table 2 compares the parking supply of Rings 0 and 1 as of late 1974, and presents supply totals for each type of on-street and off-street parking. Figure 2 (page 7), portrays the geographical boundaries of the two parking program areas.

TABLE 2
RING 0 AND RING 1 PARKING INVENTORIES - 1974

TYPE OF SPACE	RING 0	RING 1	RINGS 0,1	PERCENTAGE OF TOTAL SPACES
Commercial and Permit Garages	36,924	16,014	52,938	30
Government Lots and Garages	13,355	28,920	42,275	24
Commercial and Permit Lots	13,904	10,800	24,704	14
On-Street Non-Metered	1,802	17,321	19,123	11
Customer/Private Lots and Garages (free parking)	3,865	9,208	13,073	8
Apartments	1,739	7,500	9,239	5
On-Street metered	2,806	1,775	4,581	2
Other	1,964	7,955	9,919	6
Totals	76,359	99,493	175,852	100

SOURCE: Metropolitan Washington Council of Governments

Government parking facilities and commercial/permit garages and lots constitute the majority of parking supply in the core, 68 percent. On-street parking represents only 13 percent of the parking spaces in Rings 0 and 1; most of these spaces are in Ring 1 residential areas. In summary, the core's parking supply is dominated by commuter parking facilities.

The various subareas of the regional core reveal large differences in their parking characteristics. Capitol Hill, SW Mall, the Pentagon, and the Federal Triangle area are characterized by large concentrations of government parking. The K Street/Connecticut Ave. office district is dominated by parking garages, as is Rosslyn. Areas north of Massachusetts Ave. and Georgetown are primarily residential and suffer from on-street commuter parking.

Downtown Silver Spring contains approximately 7,000 metered spaces, on- and off-street, which are operated by a public parking authority. The metered spaces represent 62 percent of downtown Silver Spring's 11,200 parking spaces.

AVAILABILITY OF PARKING SPACES

Table 3 presents data on parking space availability per square mile and jobs per space for several subareas of the core.

TABLE 3

PARKING SPACES PER SQUARE MILE AND JOBS PER SPACE

General Area	Spaces Per Square Mile	Jobs Per Space
Ring 0	41,500	3.6
State Department	78,500	6.1
Federal Triangle	55,000	8.4
K Street/Conn.Ave.	126,000	2.2
Municipal Center	44,000	4.8
Capitol Hill	5,900	4.2
Rosslyn	30,500	0.8
L'Enfant Plaza	60,000	0.9
Pentagon	8,300	3.4

SOURCE: Metropolitan Washington Council of Governments

Areas of the core which have not experienced extensive building of parking garages tend to exhibit jobs per space rations in excess of 3:1. Areas which contain a large number of recently-completed parking garages exhibit much lower job-to-spaces rations, as low as 0.8:1 for Rosslyn. Such an abundant supply of parking tends to discourage transit ridership to these areas.

PARKING FEES

The parking rate structure in the downtown CBD (Ring 0) is characterized by high commercial rates for short-term parking with substantial discounts for long-term parking. Average rates and free parking levels for the CBD in late 1974 were as follows:

Parking Parameter	Ring 0	Ring 1
First Hour Rate	$ 0.75	$ 0.75
Daily Maximum Rate	$ 2.55	$ 2.18
Monthly Contract Rate	$42.00	$35.00
Monthly Permit Rate	$32.00	$27.00
Overall Percent Free Parking	17%	53%
Percent Free Parking at Government Facilities	37%	67%
Monthly Rate Range at Government Facilities	$0 - $35	$0 -$15
Average Monthly Rate at Federal Government Facilities	$5	$3

PARKING OCCUPANCIES

Table 4 summarizes occupancies for on-street and off-street parking in the core. Data was collected by field samples including samples from all major subareas of the core.

TABLE 4

PARKING OCCUPANCIES IN THE CORE (1974)

	Occupancy Percentages by Time Period		
Type/Location of Parking	9:00 AM	10:00 AM	1:00 PM
On-street, Ring 0	-	120	117
On-street, Ring 1	-	102	110
Commercial Lots, Ring 0	64	82	92
Commercial Garages, Ring 0	53	74	85
Commercial Lots, Ring 1	-	69	88

On-street occupancy samples for the core indicate full utilization of legal spaces and some illegal parking. Off-street facilities, lots and garages, appear to be operating at close to capacity levels during the mid-day period.

SOURCE: Metropolitan Washington Council of Governments

PARKING TAX

In December, 1975 an 8% parking tax was levied on commercial parking in the District of Columbia. Spot checks of commercial parking facilities showed hourly, daily, and monthly rates in late 1975, following the implementation of the parking tax, to be approximately 10% above 1974 rate levels.

Technical Analysis

The central objective of the technical analysis was to determine whether alternate parking programs could achieve the 1977 emissions reductions scheduled for parking management policies. The following data was required as input to the analysis procedures:

1. Home-work person trip demand matrix for 1977

2. Projected 1977 transportation system (highway and transit network)

3. Inventory of parking spaces by type and cost; occupancy data

Analysis then proceeded in three stages:

1. Forecast of modal choice for home to work travel (1977)

2. Determination of modal choice sensitivity to parking cost in selected areas

3. Determination of the effectiveness of substituting parking supply constraints for parking fee increases, including the $2 surcharge

PARKING MANAGEMENT PROGRAMS

Since no single parking strategy could produce VMT reductions required to meet 1977 air quality standards, strategies were grouped into programs for testing. Each program contains a set of strategies which are complementary in their implementation interactions and are capable of achieving substantial emissions reductions. Long-term

parking, is defined as a parking duration of six or more hours. Short term parking (less than six hours) and residential parking were considered to be exempt from the imposition of parking strategies in a 1977 time frame.

PROGRAM 1: PRICING TECHNIQUES INVOLVING A SURCHARGE

1. New equitable rates for free and low cost long-term parking. These rates would be set at levels comparable to the prevailing commercial rates in areas with similar work trip densities.

2. The implementation of a $2 per day surcharge on long-term parking. The surcharge applies to commercial, government, and private parking.

3. Strict enforcement of parking violations.

4. A ban on metered on-street parking prior to 10 a.m. on weekdays.

5. Conversion of all on-street reserved and permit spaces, except diplomatic, to metered spaces.

The last three strategies grouped together are also used in Programs 2, 3, and 4 and are referred to as Auxiliary Techniques.

PROGRAM 2: PRICING TECHNIQUES NOT INVOLVING A SURCHARGE

1. New equitable rates for free and low cost parking.

2. Increase monthly contract and permit rates by an amount equal to a $2 per day surcharge.

3. Replace daily maximum rates with a hourly flat fee. The total fee for nine hours would be an amount equal to the former daily maximum rate plus a $2 surcharge.

4. Auxiliary techniques: enforcement, meter limits, permit space conversions.

PROGRAM 3: SUPPLY RESTRAINT TECHNIQUES

1. Establish supply restrictions on off-street long-term parking through conversion of some facilities to exclusive short-term parking and the implementation of long-term parking quotas in other facilities.

2. Establish residential permit systems for all non-metered on-street parking in and adjacent to parking management areas. Non-resident parking would be limited to a 2 hour period, resident vehicles would be identified by parking stickers.

3. Auxiliary techniques: enforcement, meter limits, permit space conversions.

PROGRAM 4: COMBINATION SUPPLY RESTRAINT - PRICING TECHNIQUES

1. Establish residential permit systems for all non-metered parking in and adjacent to parking management areas.

2. Implement new rates for free and low cost long-term parking.

3. Implement a $1 per day surcharge on long-term parking.

4. Auxiliary techniques: enforcement, meter limits, permit space conversions.

Additionally, the legal issues and institutional/administrative problems as they affect the implementation of car pool priorities were investigated although no quantitative analysis was conducted. It is recommended that current carpool priority and locator programs in the metropolitan area be expanded as a part of any parking policy program.

ANALYSIS OF PRICING STRATEGIES

Two mathematical models[4/], applied sequentially, were used to investigate the relationship between parking cost and modal choice. The first, modal choice model, determines whether the principal mode of travel is by auto or transit; the second, car occupancy model, further divides the auto users between drivers and passengers.

4/ Both of these models were calibrated on zonal data collected in a comprehensive series of travel surveys conducted in 1968. Details of the calibration and operation of these models are presented in a separate report: Development and Calibration of the Washington Mode Choice Models by R.H. Pratt Associates, June 1973, Technical Report No. 8 of the National Capital Region Transportation Planning Board/Metropolitan Washington Council of Governments.

The modal choice model employs the concept of "disutility". This concept assumes that a journey has no intrinsic value itself, rather transportation is "consumed" to arrive at a destination. The model further assumes that each potential traveler rationally compares the cost and time of travel by either auto or transit; the traveler, subject to certain constraints, chooses whichever mode minimizes his time and cost (utiles).

The car occupancy model, second in the chain, operates on the residual (non transit) trips. Auto users are stratified into drivers and passengers based upon the income of the traveler, the cost of parking and the density of trips making similar movements.

Using these models, sensitivity tests were conducted for each of the areas originally specified in the EPA promulgation. Both auto driver trips and VMT reductions were forecast for the following scenarios:

1. The 1977 base case including transit improvements with no new parking policies

2. Implementation of equitable commercial rates for free and low cost commuter parking

3. Rate increases of $1 and $2 per day, applied by either a surcharge or a revision in the rate structure

The 1977 base-case transit system includes the operation of METRO rapid rail between Silver Spring and Dupont Circle, and between National Airport and RFK stadium. Seven new bus priority corridors were also assumed to be implemented by 1977 (See Figure 3). Table 5 presents the results of these sensitivity tests for each of the areas determined to have "adequate transit" in 1977 (66 per cent of the work trips within 45 minutes or less by transit). As a comparison with the projection year, auto driver trips surveyed in 1968 are included in the table. It is estimated there were 138,400 home-to-work auto driver trips to the regional core (Rings 0 and 1) in 1974, a gain of 6 per cent over 1968, but approximately the same level as 1972. This would indicate that the fuel problems of 1974 were influencing auto driver trips.

If parking programs 1 or 2 were applied, it is estimated home-to-work auto driver trips to the regional core would decline by 34,200 per work day, from the 1977 base case, or 31 per cent. The largest percentage decreases in auto driver trips would be to the Pentagon (47%) and Capitol Hill (45%). The areas currently have substantial amounts of free parking for government employees.

FIGURE 3: 1977 MAJOR TRANSIT IMPROVEMENTS

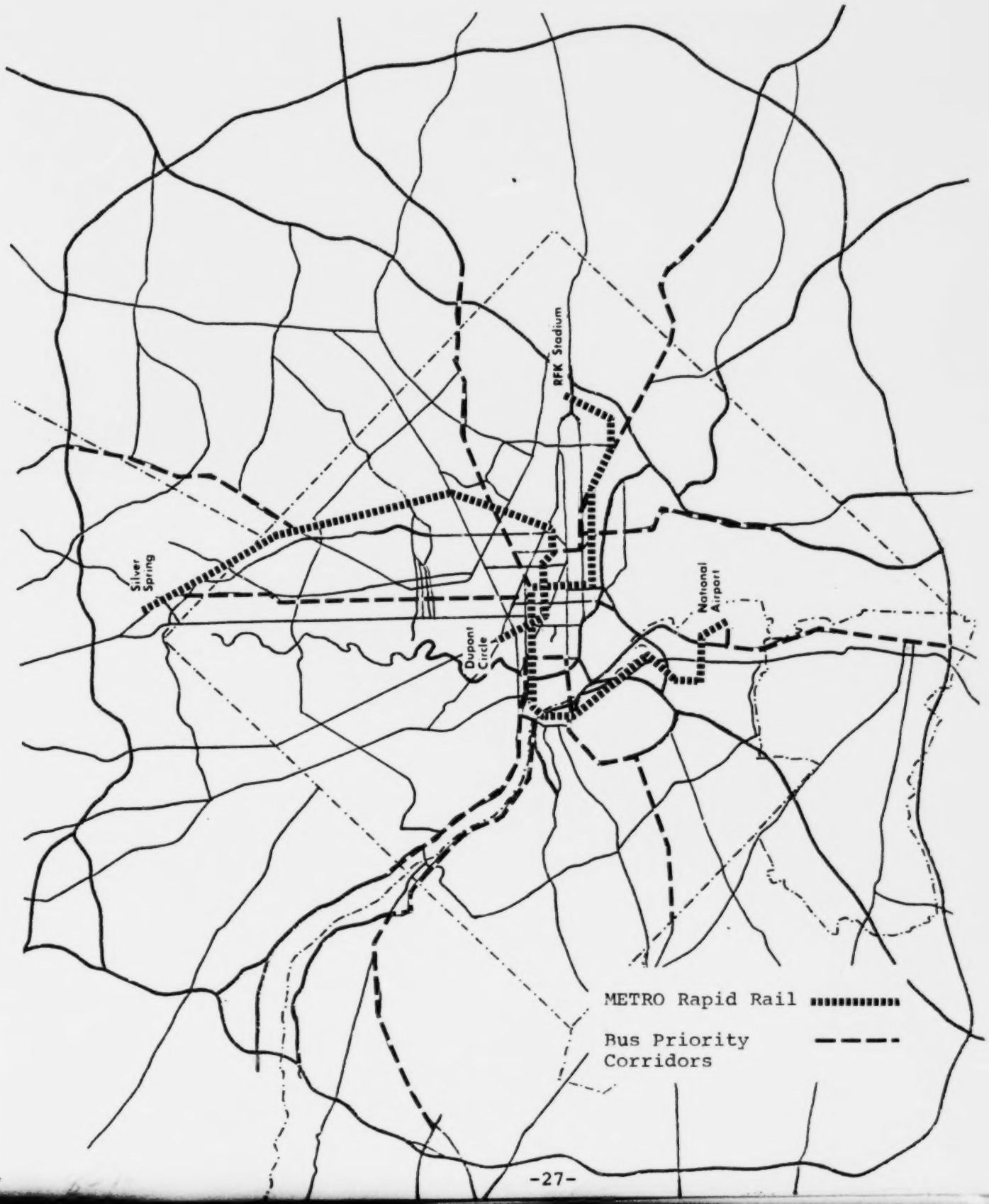


TABLE 5

IMPACT OF PRICING PROGRAMS ON DAILY HOME-TO-WORK AUTO DRIVER TRIPS

Auto-Driver Destinations

Area	1968	1977 Base Case	Implement Commercial Rates	New Rates Plus $1 Surcharge	New Rates Plus $2 Surcharge	Percentage Change Base/$2 Surcharge
Ring 0	65,300	50,500	45,900	41,000	31,900	-27
Capitol Hill	6,800	3,900	2,700	2,400	2,200	-45
SW Mall	11,100	11,500	9,200	8,200	7,300	-36
Pentagon	16,100	9,000	5,900	5,300	4,700	-47
Rosslyn	4,500	5,100	4,200	3,800	3,400	-33
Remainder of Ring 1	27,700	19,600	15,400	14,400	13,600	-31
Silver Spring	6,800	10,000	8,400	7,900	7,300	-21
Total	137,000	109,600	91,700	83,000	75,400	-31

SOURCE: Metropolitan Washington Council of Governments

REDUCTION IN AUTOMOBILE EMISSIONS

Estimates of emissions of the major auto pollutants - hydrocarbons (HC) and carbon monoxides (CO) - were made using the EMISS model developed by the Metropolitan Washington Council of Governments. This model calculates running emissions, "cold start" emissions (trip beginnings), and "hot soak" emissions (trip ends).

The implementation Plan promulgated by EPA in December, 1973, required a 0.8 ton reduction in 6:00-9:00 AM hydrocarbons as a result of parking disincentives. The following hydrocarbon reductions are projected for the Programs 1 and 2. These projected reductions do not include the possible impacts of additional short-term non-work auto trips which could be induced by a temporary over-supply in parking.

Implement commercial rates for free and low cost commuter parking	0.38 tons
Implement commercial rates plus a $1 surcharge (or increase in rates)	0.63 tons
Implement commercial rates plus a $2 surcharge (or increase in rates)	0.83 tons

Thus both pricing programs are technically capable of meeting the 1977 standards.

If the pricing programs were implemented in all thirteen areas originally promulgated by EPA for parking disincentives, the projected daily HC reduction is estimatated to be 1.04 tons in 1977.

Study results also indicated that these two parking disincentive strategies would cause a CO emission reduction very similar to that previously projected in strategy development work, resulting in the attainment of CO standards in 1977.

ANALYSIS OF SUPPLY RESTRAINT PROGRAM

The long-term parking supply restraint program was tested with a Parking Allocation Model developed for the Federal Highway Administration (ALOCAT Model)5/. ALOCAT is essentially a linear program which attempts, for a given number of parkers (auto drivers), stratified by income and a final destination zone, to allocate among alternative parking facilities in a way which minimizes the joint disutility for all.

A reduction in simulation detail was dictated by the high cost of a model run. Thus, districts rather than zones were used for simulation of the D.C. core and parking was not disaggregated by facility type in the tests.

5/ Program Documentation, Urban Transportation Planning, U.S. DOT, Federal Highway Administration, March, 1972.

Four tests of ALOCAT were made to establish the following relationships for the D.C. core:

1) the base 1977 condition
2) the implementation of average commercial rates on free and low-cost commuter parking
3) a $1.00 commuter parking surcharge
4) a $2.00 commuter parking surcharge.

For each, a disutility weighted by socio-economic groups was obtained. Using the 1977 base condition as a reference point, the increase in disutility predicted by the ALOCAT model and the reduction in auto driver travel predicted by the mode choice model were plotted for the base residential parking permits, $1 and $2 surcharge conditions. Thus a curve relating disutility to auto driver reductions was obtained for each area. Pricing and supply techniques are compared, using this curve.

The implementation of residential parking permit areas in the D.C. core resulted in only a 5% reduction in auto drivers. Since 1977 transit improvements would create a projected excess of parking supply over demand in the D.C. core, the excess spaces would have to be restrained to induce a supply-demand equilibrium. Tests showed a 42% restraint of total spaces in terms of their use by commuter long-term parkers would produce a commuter auto driver reduction of 13 percent. This is the same reduction that would be achieved by implementing commercial rates for free and low cost commuter parking. The space restrictions would be accomplished by converting some off-street facilities to short-term parking only and implementing long-term parking quotas in other facilities.

It was further determined that 59 percent of the parking spaces available in the D.C. core (Rings 0 and 1) in 1974 would have to be denied to commuter parking to achieve the auto driver reductions of the pricing programs. This space restraint would probably be somewhat less in terms of 1977 parking supply. Market pressures caused by excess parking spaces generated by the improved transit system would force the closure of marginally productive facilities, further diminishing the parking supply.

ALOCAT was also used to examine parking allocation in Rosslyn and downtown Silver Spring. Rosslyn would need the implementation of residential permit systems, plus the denial of approximately 5,000 additional off-street spaces to commuters to achieve the impact of the pricing programs.

In downtown Silver Spring, adjoining residential permit areas would need to be coupled to the restraint of approximately 4,500 spaces from long-term commuter use to equal the pricing impacts.

In summary, large numbers of parking spaces would need to be denied to commuters to generate the auto driver reductions achieved by implementing pricing programs. Subareas of the region would require the following percent reduction of total spaces available to long-term commuters, based on 1974 conditions.

D.C. Core	59 percent
Rosslyn	63 percent
Silver Spring	42 percent

ANALYSIS OF SUPPLY RESTRAINT-PRICING PROGRAMS

Tests showed that Program 4, involving residential on-street permits and a $1 surcharge, would produce a 27 percent reduction in commuter auto drivers to the core. This achieves 90 percent of the 31 percent reduction generated by the pricing programs. The combination supply/pricing program has the dual advantage of enhancing the amenities of core residents, while imposing a lower rate increase for off-street parking. The small amount of hydrocarbon reduction required to meet the 1977 standards, which would not be achieved by this program, .08 tons per day, could probably be assumed by other elements of the air quality control plan.

Legal Issues

The study examined the legal issues involved in regulating parking supply and rates. A review of current powers at the local and state level is presented, as well as a discussion of the unique influence of the Federal Government in this metropolitan area. Each Parking Program is examined in turn, and reviewed in terms of its likelihood of surviving legal challenges.

FEDERAL POLICY

Federal employee parking spaces represent the largest block of spaces in the Washington metropolitan core. There are several legal bases where the Federal government had indicated its intent to cooperate fully in environmental programs, including parking management policy. The most extensive and comprehensive statements of this view are found in Sections 101 and 102 of the National Environmental Policy Act of 1969 and the Clean Air Act of 1970. These sections repeatedly assert that it is the continuing policy and responsibility of the Federal government to cooperate in protecting the environment and that this should be done in conjunction with state and local governments.

Temporary carpool priority regulations have been issued by the General Services Administration (GSA). Essentially, the regulations provide that carpools should be given priority in the allocation of parking spaces in Federally-owned/operated/leased buildings and that only one member of the carpool need be a member of the agency in order for the group to qualify.

The legal issue of Federal sovereign immunity (the Federal government cannot be sued without its permission) is important in relation to the implementation of policies concerning Federal employee parking. Two contradictory Federal Appeals Court decisions have been handed down recently concerning Section 118 of the Clean Air Act. Section 118 requires Federal compliance with Federal, state and local requirements respecting control and abatement of air pollution to the same extent that any person is subject

to such requirements.

The relevant cases are:

1. Hancock v. Ruckelshaus, 497 F.2d 1172: Sixth Circuit Court of Appeals, June 5, 1974.

2. Alabama v. Seeber, 4ELR20793: Fifth Circuit Court of Appeals, October 14, 1974.

The Court in Hancock ruled that § 118 of the Clean Air Act must be read in conjunction with § 304 of the Clean Air Act. In summary, this ruling states that compliance with the control and abatement requirements of § 118 may be compelled by suit only to the extent permitted by § 304. Section 304 permits suits against the United States only over compliance schedules and emission and performance standards. However, specific means for control and abatement are procedural and may not be so enforced.

In terms of parking policy, a plausible interpretation of the Hancock ruling is that the reduction of automobile VMT, when part of an approved state implementation plan, is itself a substantive emissions standard or limitation within the meaning of § 304. Thus, a Federal agency could be told what percentage reduction in employee VMT must be accomplished, but it would be up to the agency to decide on its own package of incentives and disincentives to accomplish this reduction.

The Seeber decision reflects a different perspective on the substantive-procedural issue under the Clean Air Act. In this case, the Court characterized the substantive-procedural dichotomy as "a semantical red herring....(which) draws no sustenance from the Act itself". Further, the Court found a clear waiver of sovereign immunity in § 118. A plausible interpretation of the Clean Air Act, as taken in Seeber, is that the Federal government must meet the VMT reductions required by air quality standards. Such compliance could include parking controls and it appears that any such action would have to come under an EPA-approved state implementation plan and could be enforced in Court.

SURVEY OF LOCAL GOVERNMENT PARKING AUTHORITY AND POLICY

A survey was conducted of the parking authority and policies of the District of Columbia and fourteen local area governments, as well as the States of Maryland and Virginia. The survey was not designed to anticipate the choice of parking policy strategies but rather to provide an indication of possible local involvement and authority. The eighteen specific issues chosen fall into four categories: the general powers;

general authority to regulate traffic and parking; regulations on motor vehicles, traffic and parking; taxing authority and its use on motor vehicles and parking.

In the realm of general powers, almost all parking regulations are enacted under the policy power as delegated by the States. (In the case of the District, delegation is from Congress.) States delegate regulatory power over traffic, roads, and parking, including the control of parking facilities, to local jurisdictions with state-specified reservations.

Zoning

Zoning is a power available to local jurisdictions to control parking. Off-street parking requirements are an integral part of most zoning codes. Zoning limits to the provision of parking spaces could provide a long-term mechanism for limiting automobile VMT.

Parking Privileges

The granting of parking privileges to special groups is an important legal issue because of equal protection concerns. The extent that special groups are legally given privileges to use the streets indicates that there are limitations on the "general public use only" doctrine which has generally prevailed in parking. Two examples of special privileges are: priority parking for the handicapped, and residential parking permit systems.

Parking Taxes

The use of local parking taxes could be influenced by the fact that taxation is a state power and local governments have no inherent power of taxation except as specifically granted by the state constitution or legislation. Taxation power in the District is subject to Congressional plenary power. Local licensing power, as distinct from taxing power, is regulatory in nature. A license or percentage tax on parking lots may take the form of a flat license fee or a license tax on the privilege of doing business. The District of Columbia and most Virginia jurisdictions impose a percentage tax on parking lot revenue. In Maryland, the State licenses garages (a flat fee to be determined by the area of the premises) and with exceptions, this would prevent local taxation of parking facilities.

CONSTITUTIONAL ISSUES

Parking ordinances may be unconstitutional either per se or as applied. If an ordinance is unconstitutional per se, it must be discarded notwithstanding that its actual implementation may achieve a legitimate governmental purpose. If, however, it is merely unconstitutional as applied then the ordinance need only be "corrected" by rewriting so that the

manner in which the basic concept is implemented will meet Constitutional standards.

Parking ordinances are subject to the Constitutional standard of due process. The requirement of reasonableness is perhaps the most important element of due process. To meet this standard, a parking ordinance must have a clear, reasonable, and substantial relationship to the public health, safety, or welfare, and must be appropriate to the desired objective. A second due process requirement - property may not be taken without just compensation - may also play a significant role in the legality of parking control ordinances.

A second fundamental Constitutional issue concerning parking policy is equal protection of the laws. It forbids different requirements for those in the same class and other inequities which have the effect of being unreasonably discriminatory. The requirement is not that the categories be completely distinct or that absolutely all inequality be excluded. Rather, the standard is one of reasonableness - there must be a substantial distinction between classes and within a class the law must apply equally to all members.

The Commerce Clause, which reserves to Congress exclusive jurisdiction "to regulate commerce ... among the several states", is a potential restraint on parking control strategies. To the extent that commuters crossing state lines are in interstate commerce, taxes and other parking restrictions upon them may be burdens on commerce and beyond state authority to impose. Closely related is the federally-guaranteed right to travel (Shapiro v. Thompson, 394 U.S. 618; 1969).

LEGAL ISSUES PERTAINING TO SPECIFIC PARKING MANAGEMENT TECHNIQUES

The parking techniques which comprise the four parking programs raise several legal issues. In general, programs 1 and 4 (pricing program involving a surcharge, combination surcharge/permit program) are expected to encounter less legal difficulties than the rate regulation and supply restriction programs.

Issues Pertaining to Auxiliary Techniques

Three parking control techniques are part of all four programs: conversion of on-street permit spaces to metered spaces, no metered parking prior to 10:00 a.m. on weekdays, strict enforcement of parking violations.

The problems involved in the conversion of on-street permit spaces to metered spaces are primarily political. From a strictly legal point of view, a simple change of policy is all that is needed. This would require action by the Capitol Police Board, the Director of the National Capitol Park Division

and the District of Columbia Council, each for their respective jurisdictions within the core area. Politically, it is likely that Congressional action, or an Executive Order setting the new policy, would be required.

No legal challenge should be expected in regard to a ban on metered parking prior to 10 AM on weekdays, nor would one be likely to succeed.

The prime problems of strict enforcement of illegal parking are administrative: more enforcement, better mechanisms for apprehending scofflaws, manpower, and fines that reflect genuine disincentives. Additional reciprocal parking legislation is needed to make enforcement more effective.

Issues Pertaining to Program 1 (Surcharge)

EPA cannot impose average commercial parking rates or a parking surcharge on Federal agencies. It is an open question whether the District of Columbia Government could impose such policies on the Federal government because of differing interpretations (viz: Hancock and Seeber decisions) of the Clean Air Act. Regardless, the Federal government will be responsible for employee VMT reductions even though it might not have to follow specifically-promulgated programs imposed by state or local governments. To meet employee VMT reductions, Federal agencies would need to impose parking controls, unless the facilities are exempted by the President under § 118 of the Clean Air Act.

In regard to commercial and permit parking facilities a parking surcharge can probably be implemented as either a regulatory fee (license) or a tax. The courts tend to downplay the differences between these two mechanisms where the municipality possesses both the police and taxing power and the regulated industry or action could be specially taxed. However, practical considerations govern the manner in which a surcharge should be implemented and some difficulties, both legal and political, can be anticipated.

In creating the parking surcharge as a regulatory fee, a useful analogy can be made to parking meters. They share the characteristics of being regulatory or license fees, enacted under the police power, and restricted to the reasonable cost of regulation, but capable of generating large amounts of revenue. Parking meter fees have been sustained when fixed at a point where some parking will be discouraged. Also, some cases have expressed the view that excess receipts may be used in support of any aspect of street and parking area acquisition, construction, maintenance, and management. Such wide latitude, if applicable to the surcharge, would go far toward alleviating problems created by the necessarily high surcharge producing an excess of income over costs.

Constitutional challenges on the grounds of due process or equal protection of the laws are unlikely to succeed if

the surcharge does not unreasonably establish classifications for application. The "early morning driver" classification can be justified on its relationship to the production of photo-oxidant smog. A "commuter" class is within the scope of the recent U.S. Supreme Court decision on parking taxes in Pittsburgh v. Alco Parking Corporation.

Alco Parking is suggestive of the Court's attitude on the surcharge-related issues of the right to travel, and commuting by automobile as a basic necessity of life. The Court said, "the city was constitutionally entitled to put the automobile parker to the choice of using other transportation or paying the increased tax". A likely interpretation is that the courts would view a surcharge as a "toll" and not as a barrier to interstate transportation.

Attempts to force owners of free private parking facilities to charge average commercial rates are not likely to withstand court review. An alternate approach would be to tax the owner of free parking spaces and rely on cost pass-throughs to reach the consumer. Two techniques could be used:

1. tax the owner of a building for every parking space that is used for "other than commercial parking" purposes.

2. tax the owner/employer for providing free space, preferably on a per space basis.

In either case, there would be some question as to whether the distinction between "open to the public" and prepaid parking spaces or between employer and employee-paid parking space costs provides a reasonable classification for either regulation or taxation. While the court in Alco Parking Corporation approved a tax on commercial parking facilities and acknowledged its propriety as a "pass through" to commuters, the decision in no way reaches the problems of taxing sub-classes of commuters, particularly those who would be unaffected by taxes on commercial facilities.

Attempts to directly tax the user of free private parking space would take the form of having the Internal Revenue Service declare free parking a form of remuneration and, therefore, taxable. However, the IRS has not shown strong support for this step and calculations show the average tax would only amount to 36¢ per working day.

Issues Pertaining to Program 2 (Rate Regulation)

The legal problems involved in achieving higher daily and monthly rates via rate regulation are widely different between public and commercial facilities. The major jurisdictions of the metropolitan area have the authority to set rates for public off-street parking facilities. The operation of

certain public facilities for car pools only and for short-term parking only is apparently within the scope of local authority. However, the rate regulation of the commercial parking industry presents a number of legal uncertainties.

Rate regulation in the commercial parking industry would most likely be attempted under the doctrine of "Businesses affected with a public interest." Generally, this means that, "an industry, for adequate reasons, is subject to control for the public good." (Nebia v. New York, 291 U.S. 502; 1934). Regulations under this doctrine must be reasonable and necessary.

There are four tests which a rate regulation measure must meet in order to pass the judicial test of reasonableness:

1) the measure must be necessary in the interest of the public health, safety, morals, and general welfare,

2) the legislation must be substantially related to the evil sought to be cured,

3) the class of business, products, or persons to be regulated must be related to the legitimate object of the legislation, and

4) the rates set must be reasonable, and not unnecessarily prohibitory and confiscatory.

In anticipating court reactions to parking rate regulations, it is important to note that air pollution and traffic congestion make a strong case for the "reasonableness" of rate regulation "in the public interest". However, there is no exact legal precedent to draw upon. The argument for such an approach is strengthened in that parking regulation has been sanctioned as part of building and zoning ordinances.

In addition to the police power, the District of Columbia has the power to regulate businesses, specifically by licensing (D.C. Code §47-2301). Currently commercial parking facilities are licensed under Article 28 of the Police Regulations. The D.C. Council could set parking rates as a part of the police power regulatory function, and also explicitly condition approval of a license on compliance with the rate schedule.

With respect to a second legal issue, equal protection of the law does not forbid reasonable classification for the purpose of local legislation. Such classification for the purpose of taxation is common and would give support to a classification system for parking rates. Further, since it would be hard to tie down these strategies as a discrimination against any particular class, such a classification would probably be sustained as a proper police power measure.

These comments on the legal parameters of rate regulation also apply to the technique of providing special rates for carpools.

ISSUES PERTAINING TO PROGRAM 3 (SUPPLY RESTRAINTS)

There are no anticipated legal problems in implementing short-term only facilities or long-term parking quotas at publically-owned and operated facilities. However, there are considerable legal problems with respect to commercial and private facilities. A key distinction is whether the strategy will be implemented retrospectively or prospectively. Retrospective enactment would mean that all commercial facilities would be covered by the law, regardless of the date or conditions of their establishment; prospective would limit the coverage of the strategies to new facilities.

Equal protection would be an issue because some facilities would be totally converted to short-term parking and others, only partially. To be upheld in court, some rational classification would need to be shown by which the facilities could be divided. This problem would be eliminated if a standard short-term quota were enacted.

The due process taking-without-compensation issue is complex. Because of the severe retrospective effect of conversions or quotas, the courts would be likely to demand a strong showing that there was an overriding public need for the regulations and that no less disruptive means could be utilized. If these short-term strategies were implemented prospectively only, they could be enacted as zoning regulations and the "taking without compensation" objective would be eliminated.

In summary, the chances of any legal retrospective enactment to conversion or quota short-term strategies with respect to commercial parking facilities are slim. At a minimum, it would require the courts to reach the unlikely conclusion that these strategies are the only alternative to local governments.

The above comment also applies to the establishment of carpool quotas at commercial facilities.

An in-depth study of the legal issues, court decisions, and past, current and proposed ordinances, leads this study to the conclusion that residential parking permit systems are constitutional, if properly drafted to meet genuine community need. To date this proposition has not been affirmed in court but is generally supported by many local governments and constitutional authorities. Parking permits, however, are a highly controversial control format and extensive litigation should be expected until such time as a definitive court ruling is made.

A parking permit system is more likely to be affirmed in court if it has: 1) a clear statement of public need for the

ordinance, under the police power over public health, safety, and welfare, 2) reasonable provisions for parking by non-residents to the maximum extent consistent with its purposes, 3) no unreasonable restrictions on commercial vehicles, 4) provisions for adequate notice to the public, 5) no provisions for arbitrary exceptions, 6) the same effect on non-area city residents as it does on non-city residents, and 7) a minimum cost for residential permit.

Implementation Problems

Both institutional and administrative problems will be encountered in the implementation of parking programs. Institutional issues are essentially political and involve the interrelationships between public and private institutions in planning and policy formulation roles for parking management strategies. Administrative issues are involved with the physical implementation and operation of particular strategies.

INSTITUTIONAL ISSUES

There are five major institutional issues which are common to the four parking programs:

- Policy of the United States Congress
- Role of the United States Government in the provision of employee parking
- Federal-local cooperation and coordination
- Regional cooperation: equity of impacts
- Community support for parking programs: business and citizen groups

The first three institutional issues are more significant in the Washington area than in other cities because of the large amount of long-term parking provided for Federal employees. If parking programs are not supported by the Federal government, there is little prospect for support at the local government, business, or community level.

The attitude of the U. S. Congress will be a key institutional determinant of any major parking program implemented in the Washington Metropolitan Area. The political difficulties of applying a parking surcharge, for example, have substantially increased since its "de-promulgation" by EPA, in anticipation of congressional action. At a minimum, congressional support will be needed to raise free and low-cost government parking fees to average commercial levels, in addition to imposing parking taxes (sales or excise) in the District. Congressional opposition to residential parking permit areas in D.C. needs to be tempered. Support of a public parking authority for the District would help in the restructuring of the core parking supply over a five-to-ten year period.

The Federal Executive possesses the powers of veto and Executive Orders with respect to parking programs. Equally important, a parking policy program coordinated with urban transportation and energy programs could be submitted by the Executive to Congress for its review and action.

Although the General Services Administration (GSA) supervises the management of many of the Federal parking facilities, there is no one unified management entity or policy applicable to all Federal parking. A policy program must be developed to resolve this situation and the program needs to address the following points:

- The management mechanism for supervising the implementation and collection of higher rates.
- The rate structure in terms of rate levels and geographical areas of application.
- Mechanisms for bringing other government parking rates into parity with Federal rates.
- Formal procedures for the periodic adjustment of rates.
- Special applications of the revenues generated.

Institutional frictions between the Federal and local governments are probable in parking management questions. The only parking programs which this study has determined capable of meeting the 1977 air quality standards apply to both public and private parking and involve substantial increases in parking costs or supply restraints for long-term parking, or both. No major sphere of parking can be exempt from management programs, if air quality standards are to be attained.

Parking management policies define issues of equity between jurisdictions which broadly divide into two spheres: administrative burdens and economic disadvantages in areas with parking policies; the transportation problems which are encountered by residents of other areas who must travel into the parking policy areas. Regional cooperation is needed to develop procedures which help resolve these equity questions. Complementary transit programs, including adequate fringe parking facilities will be important to the success of any parking program. Coordinated growth policies including an element which coordinates the location of new parking facilities are also needed. In the Washington area, excellent regional cooperation and coordination for multi-

modal transportation planning exists - but is currently lacking for regional parking programs.

Merchant, business, and trade groups in parking policy areas will evaluate proposed strategies in terms of anticipated impacts on their operations. Major themes they will address are the need for more short-term parking with more suitable rates, improper location of parking facilities, poor facility design, and the shifting supply of parking. These concerns must be the subject of more detailed planning before the implementation of regional parking programs. Therefore, institutional arrangements must be made to obtain inputs from the business community as part of the planning process. Additional inputs will be needed from commuters, citizen groups, shoppers, the trucking and taxi industries, and residents affected by commuter parking in their neighborhoods.

Given the variety of institutional inputs needed to develop effective parking policies, and anticipated conflicts of viewpoints, the 1977 target date for implementation of major strategies will be difficult to attain.

ADMINISTRATIVE ISSUES

There are three important general administrative questions for parking management: should responsibilities be at the local or regional level; should there be unified administration over government, commercial, and private parking; should responsibilities be assigned to existing local/regional agencies or to newly-created specialized parking authorities.

Most of the areas projected to be adequately served by transit in 1977 and suitable for comprehensive parking programs are in the District of Columbia. Because of this situation and anticipated institutional problems a regional parking authority is not considered feasible in a 1977 time frame. Administration of parking programs involving commercial and private parking, would be at the local level. Unified management of Federal Government and commercial/private parking strategies would entail enabling congressional legislation and is not considered probable by 1977. All federal parking programs should be subject to unified management under the General Services Administration (GSA). Coordination procedures between federal and local parking strategies to produce comprehensive parking programs should be established within the mandate of the Intergovernmental Cooperation Act of 1968.

Existing local departments could administer strict enforcement of parking violations, 10:00 a.m. meter limits, conversion of on-street permit spaces to meter spaces, residential permit areas, and the collection of higher rates and parking

taxes for private and commercial parking. A parking authority would be more suitable for the regulation of rate revisions, car pool priorities, and long-term parking supply restrictions. However, municipal parking authorities have traditionally been formed to provide additional public parking. They have not been used to collect parking taxes or to regulate commercial and private parking with the goal of minimizing long-term parking. Thus, it is recommended that a thorough management study be conducted for the proper authority structure in light of those parking policies likely to be implemented as part of parking management programs.

IMPLEMENTATION PROBLEMS RELATED TO THE PARKING MANAGEMENT PROGRAMS

Auxiliary Techniques

Implementation problems for the three auxiliary techniques which are part of all four parking programs are mainly related to the strict enforcement of parking violations. These problems include:

- adequate manpower for enforcement
- possible creation of a parking regulation enforcement body other than the regular police force
- adequate information systems for identifying chronic violators
- need for reciprocity agreements between jurisdictions on parking violations
- possible substitution of administrative hearings for court proceedings
- establishment of higher parking fines
- consideration of the use of citizen parking patrols on complaint centers

No major problems are foreseen for a ban on metered parking prior to 10:00 a.m. although some loss of meter revenue is involved. The conversion of on-street permit spaces to metered spaces depends directly on positive Federal policy including Congressional approval. No administrative problems are contemplated as the meters could be installed by either the Park Service or the D.C. Highway Department. Application of revenues for public transportation could be considered.

Car Pooling

Carpooling techniques should be complementary to any parking program. Information systems such as the current metropolitan area carpool locator service should be expanded, and carpool priority programs in effect at Federal facilities should be retained.

Voluntary carpooling programs involving rate reductions or quotas at commercial facilities are apt to be resisted since the implementation of other elements of parking programs could reduce parking revenues. A mandatory carpool priority program at commercial, permit, and private facilities faces legal difficulties and would necessitate regulation administered by a public body. Periodic registration, with appropriate proof of carpooling would be a problem as would identification of violators. The establishment of carpool only facilities could simplify administrative problems but would face legal problems if imposed on commercial or private facilities currently in operation.

Commercial Rates for Free Parking and a Parking Tax

Substantial opposition to the implementation of commercial level fees for Federal parking is to be expected from employees and the impacted departments and agencies. Congress would need to approve of the new parking fee policy, and suburban members are apt to reflect the apprehensions of their constituents currently using the free/low cost parking.

From an institutional standpoint a $2 per day parking tax can expect to encounter substantial political opposition at all levels. Most important is the current apparent opposition by Congress toward a surcharge. Without Congressional approval it is doubtful the District could impose a surcharge and this would effectively kill the technique in other jurisdictions.

Existing Federal and local bodies could administer a $2 per day parking tax. It would be levied simultaneously by GSA on federal facilities, and by local finance/revenue departments on commercial and private facilities. Congressional action would be required to review the imposition of a $2 parking tax by the District Government, and to designate a Federal agency to levy the parking tax on Federal facilities. The legislation would also specify:

- a time schedule for implementing the parking tax
- the form of the parking tax; i.e., excise or sales tax; flat rate or percentage of base
- special exemptions from the parking tax
- penalties for violations
- application of parking tax revenues towards transit financing

The determination of equitable parking rates in certain areas containing exclusively, or predominantly, government facilities will be a problem, since in some cases there are no existing commercial facilities and thus no average commercial rates. In these cases work trip densities into the area can be used to determine equitable rates. A comparison would be made with commercial rates in areas with similar work trip densities.

In order to minimize the initial disruptive impacts of a $2 per day parking tax phased implementation in concert with the introduction of METRO rail is recommended:

Phase 1: December 1,1976 - implement equitable rates for free and low cost government employee parking

Phase 2: March 1, 1977 - implement a 50¢ per day parking tax on long-term parking

Phase 3: July 1, 1977 - implement a $1.00 per day parking tax on long-term parking

Phase 4: November 1, 1977 - implement a $2.00 per day parking tax on long-term parking

One primary intent of a parking tax is to deter long-term commuter parkers. The parking tax could be imposed on all weekday parking of six or more hours duration, or could be levied on all automobiles entering parking facilities between 5:00 a.m. and 10:00 a.m. on weekdays. Exemptions for tourists and shoppers have been suggested, but are not recommended because of administrative complexity and the potential for abuse. Exemptions from the parking tax should be considered for handicapped commuters. Consideration could also be given to allowing low income citizens to claim parking taxes as income tax deductions.

The parking tax should be collected from government employees as part of their monthly parking fee. For commercial, permit, and private facilities it should be levied as an excise tax on the provision of long-term parking. The operator of a facility would be accessed the tax for every space provided for a period of six or more hours during the applicable period. The excise tax

would likely be passed on to consumers of the product; i.e., long-term parkers. This procedure should simplify the collection of parking tax revenues for the local governments. It is estimated that collection costs for the parking tax would average between 2 to 5 cents per parker per day in 1977.

Parking Fee Increase Via Rate Regulation

The regulation of minimum parking rates for commercial and monthly permit parking would require new public regulatory responsibilities. Since rate regulation involves adjudicative and administrative procedures, a parking authority or commission would provide a viable mechanism for the performance of these complex tasks. No precedent exists for an authority to regulate minimum parking fees at commercial/private facilities. Therefore, the investigation of an appropriate structure and regulatory procedures for such a body would be a minimum first step in its establishment. Pending the results of further study the feasibility of implementing parking rates via a public regulation is uncertain, and considered to be unfeasible in a 1977 time frame.

Since a public body with parking rate regulation powers would be controversial, Congress would want to carefully review enabling legislation. In summary, it would be extremely difficult to establish rate regulatory procedures before January 1, 1977, when this study suggests a 50¢ long-term parking tax be implemented. Parking taxes are, however, suitable for implementation in 1976 and 1977.

The study has also concluded that parking rate regulation would tend to stifle competition in the commercial parking industry and be inherently inflexible in responding to market or urban transportation conditions. In comparison with parking taxes, rate regulation would entail substantial administrative expense without the generation of public revenues for transit application.

Residential Permit Systems

The implementation problems which pertain to strict enforcement of parking violations apply to on-street residential permit systems. The following additional problems will need to be resolved:

- identification of areas to receive permit systems
- determination of the optimum size of residential permit areas

- citizen participation
- budgetary resources
- congressional approval/disapproval
- resident identification/sticker control
- impact on adjoining areas

The District of Columbia plans to implement a non-resident daytime parking ban in the Friendship Heights area in the spring of 1976. It is recommended that additional permit programs be developed for one or two areas of the core. Areas suitable for initial implementation include Georgetown and residential neighborhoods north and west of DuPont Circle. Operational experience with residential permit programs would identify day-to-day problems and their solutions and be a prerequisite for more extensive implementation in 1977.

Long Term Parking Quotas

In addition to the legal problems previously discussed, there are a number of complex implementation problems involved in establishing long-term parking quotas and short-term only parking facilities. A new public body, such as a parking authority, would probably be needed to plan and implement supply restriction programs for commercial and private parking at the local level. GSA could be given administrative responsiblities for supply restrictions at Federal facilities. Among the problems which would be encountered are:

- the allocation of the long-term and short-term spaces to specific subareas of parking program areas
- the allocation of long-term spaces between commercial and government facilities
- surplus of short-term only spaces in government facilities
- the allocation of short-term spaces between short-term only facilities and quotas in mixed facilities
- the enforcement of short-term only regulations
- the possibility of closures of some facilities because of a surplus of short-term spaces

The problems relating to supply restrictions have more potential for resolution in a 5-10 year implementation time frame. Implementation of restriction techniques is not considered to be feasible in a 1977 time frame. The creation of a parking authority to gradually acquire parking facilities in conjunction with an F-G Street auto control zone is a promising long-term program. Under this approach, the restructuring of parking supply would be accomplished over time as coordinated extensions to the initial parking/auto control program.

Social and Economic Impacts

The introduction of parking management policies will have a positive effect on the tasks of reducing air pollution and improving traffic flow. In addition, a wide range of social and economic impacts will also be encountered. This study examines sixteen different social and economic factors. Since no rigorous quantitative methodology exists for assessing many of the impacts, the general trends of the impacts were considered.

SUMMARY OF IMPACTS

Figure 4 summarizes the aggregate impacts of the individual strategies in the parking programs on the 16 socio-economic factors.

This report highlights the key findings of the study's socio-economic analysis.

For all social and economic factors except the parking industry and the public expenditures, the impact of parking programs does not vary from positive to negative. Rather, the severity of the impact depends entirely upon the success of the parking program, no matter which strategy it may be. The more automobiles removed from the road, for whatever reasons, the greater will be the improvement in peak hour traffic flows. The more severe the parking strategy, the greater will be the disutility to automobile commuters. The more severe the strategy, the greater will be the impetus to businesses to locate outside parking management areas, in the absense of appropriate remedial public transportation services.

The social and economic impacts do not provide a basis for comparing alternatives, except to the extent of the differing fiscal impacts. Rather, social and economic impacts represent overall social and economic costs or benefits that are anticipated in the event of any parking program implementation. The positive impact on traffic flow and related factors is a socio-economic benefit; the

FIGURE 4

MAJOR SOCIO-ECONOMIC IMPACTS OF PARKING POLICIES

INDIVIDUAL ELEMENTS OF PARKING PROGRAMS

Impacts	Convert Gov't Permit Spaces to Metered	Ban Meter Parking Before 10 a.m.	Enforce Parking Regulations	Residential Permit On-Street Parking	Commercial Fees for Gov't Employee Parking	Surcharge on Gov't Employee Parking	Increase Rate for Monthly Contract and Permit Parking	Replace Daily Rate With Hourly Flat Rate	Surcharge on Long-Term Commercial/Private Parking	Privileges for Car Pools	Long-Term Parking Quotas Short-Term Only Facilities	Commercial Rates For Free Private Parking
1. Peak-Period Traffic Flow	+	+	+	+	+	+	+	+	+	+	+	+
2. Speed of Goods Delivery	+	+	+	+	N	+	+	+	+	+	+	+
3. Amount of Transit Patronage	+	+	+	+	+	+	+	+	+	-	+	+
4. Automobile Commuters	-	-	+	-	-	-	-	-	-	-	-	-
5. Transit Users	+	+	+	+	U	U	U	U	U	U	U	U
6. Employment	N	N	N	U	-	-	-	-	-	N	-	-
7. Mobility of the Transportation-Dis-Advantaged	N	N	+	+	N	U	U	U	U	U	U	U
8. Parking Industry	+	+	+	+	U	U	+	+	-	-	-	U
9. Tourism	+	+	+	U	N	N	+	+	+	U	+	N
10. Shopper Convenience in Retail Area	U	+	+	N	N	N	+	+	+	U	+	N
11. Retail Sales	N	U	U	N	N	U	U	U	U	U	U	U
12. Life Style of Residents Parking Policy Areas	N	N	+	+	+	+	+	+	+	+	+	+
13. Size of Population Parking Policy Areas	N	N	U	U	U	U	U	U	U	U	U	U
14. Land Development and Land Use Patterns	N	N	N	U	-	-	-	U	-	U	U	-
15. Public Budget (Net: Revenues minus Expenditures)	+	-	-	-	+	+	-	-	+	-	-	-
16. Land Values	U	U	U	+	U	U	U	U	U	U	U	U

IMPACT TRENDS

N Neutral/None + Positive/Increase

U Uncertain - Negative/Decrease

negative impacts on automobile commuters and the typical purpose auto trips often associated with the daily work trip (school, social, recreation, etc.) are socio-economic costs.

These costs, or disbenefits, cannot be mitigated by the adoption of one parking program instead of another, if the programs aim for the same level of reduction in long-term parking. Rather, they require remedies or compensation through adoption of other programs to mitigate the disbenefits arising from parking strategies.

TRAFFIC CONGESTION

The parking management programs will produce a decrease in home-to-work automobile traffic to the regional core and Silver Spring. For programs 1-3, a daily reduction in automobile work travel of 630,000 VMT is projected. Approximately 270,000 miles of this total should occur in the 6:00 a.m. - 9:00 a.m. peak period. Table 6 shows the daily VMT reductions for automobile work trips to parking management areas.

Reductions in VMT will be greater to areas presently having a large number of free and low cost parking spaces such as the Pentagon (45 percent) and Capitol Hill (43 percent). The largest VMT impact for an individual parking management strategy is produced by implementing equitable commercial rates for free and low cost parking (15 percent).

Figure 5 (page 56) compares VMT reductions for parking management techniques (for work trips to the regional core) with estimated 1974 VMT levels and VMT reductions produced by the implementation of transit improvements in the 1977 base case.

It is estimated that the VMT reductions generated by parking programs 1-3 will save 10.5 million gallons of gasoline per year, reduce peak period congestion, and shorten travel times for auto and bus commuters by approximately five minutes per average core bound home-to-work trip. Congestion and travel time gains could be eroded if additional through trips divert to core streets or core bound roads in the a.m. peak period.

Midday congestion may increase as additional shopper and tourist auto trips are attracted to the increased supply of short-term parking spaces. Other transportation control techniques such as short term parking strategies or auto control zones could be used to supplement the parking programs examined in this study, if needed.

FIGURE 5: IMPACT OF PARKING POLICIES ON DAILY AUTOMOBILE WORK TRIP VMT TO REGIONAL CORE: RINGS 0 AND 1
(Round Trip)

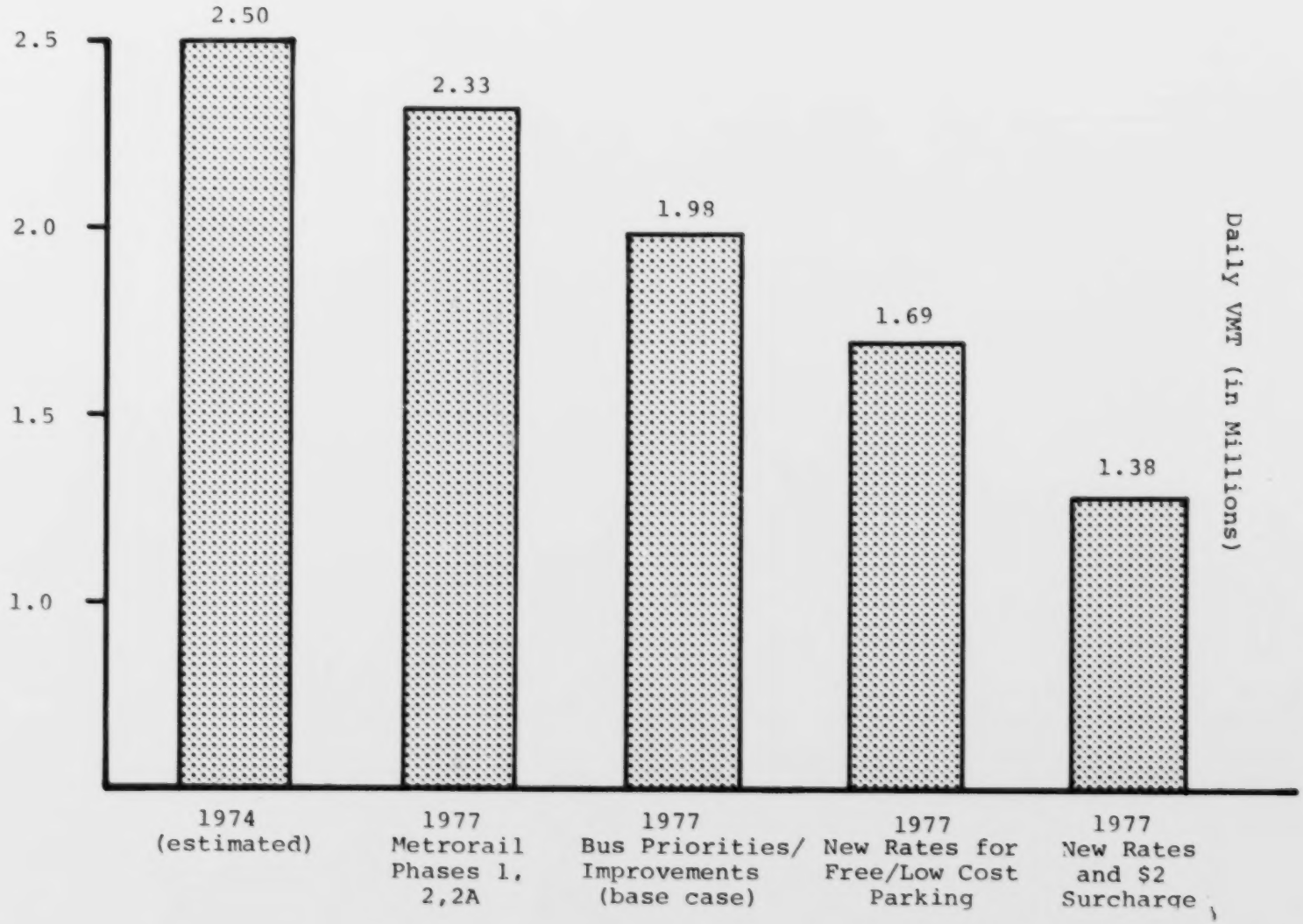


TABLE 6

IMPACT OF ALTERNATE PROGRAMS ON 24 HOUR AUTOMOBILE WORK TRIP VEHICLE MILES OF TRAVEL

IMPACT OF ALTERNATE PARKING PROGRAMS ON DAILY WORK-RELATED VMT
(Round Trip)

AREA	1977 BASE CASE	IMPLEMENT COMMERCIAL RATES	NEW RATES PLUS $1 SURCHARGE	NEW RATES PLUS $2 SURCHARGE	PERCENTAGE CHANGE BASE/$2 SURCHARGE
RING 0	1,006,000	928,000	838,000	763,000	-24
CAPITOL HILL	74,000	52,000	47,000	42,000	-43
S.W. MALL	244,000	199,000	180,000	162,000	-33
PENTAGON	188,000	127,000	113,000	105,000	-45
ROSSLYN	101,000	85,000	77,000	70,000	-31
REMAINDER RING 1	364,000	294,000	266,000	241,000	-34
SILVER SPRING	134,000	113,000	106,000	98,000	-27
TOTAL	2,111,000	1,798,000	1,627,000	1,481,000	-30

GOODS DELIVERY

The suggested parking programs, if amplified by regulations concerning the curbside parking of service trucks, should aid goods deliveries in the core. If service vehicles not engaged in deliveries were required to park in off-street facilities (where vacant spaces will be created by parking programs), loading zones could be freed for the exclusive use of delivery vehicles and help abate double parking. In addition, goods deliveries could be aided by the abatement in peak period traffic congestion.

SHOPPERS AND TOURISTS

Shoppers and tourists will benefit primarily from the availability of additional short-term parking spaces. This impact will be more important in certain locations within the D.C. core such as the F/G Streets retail area, areas surrounding the Mall and Georgetown. The impact in Silver Spring will be tempered because of a presently adequate supply of short-term spaces.

RETAIL SALES

Parking management programs are not expected to have a large immediate negative impact on retail sales in the core, if they are established in conjunction with Metrorail service and other transit improvements. No direct relationship exists between the expanding parking supply in Ring 0 and retail sales over the past few years. Total parking spaces in Ring 0 increased 23 percent between 1968 and 1974 while department store retail sales declined. In the long term, retail sales will tend to increase to the extent shoppers and tourists use the off-street spaces which become available, or benefit from improved transit service coordinated with parking programs. However, if parking policies precipitate an exodus of businesses and employees from parking management areas, retail sales in the core will tend to decrease.

COMMUTERS

The largest immediate impacts of parking programs are on automobile and transit commuters. Auto drivers face either more costly parking or a reduction in parking space availability. Their diversion to transit is a result of disutilities created by the parking programs and not necessarily because of more convenient transit trips.

Comparison of the 1977 base case with the pricing programs shows that impacts vary by income groups. The person most likely to switch from automobile to transit is the middle income commuter. The low income commuter is largely a transit captive in the base case, whereas the high income commuter resists diversion to transit. Table 7 (next page) presents normalized figures for mode of travel for each income group.

TABLE 7

NORMALIZED MODAL CHOICE TO THE CORE

Impacts by Income Group Per 1,000 Commuters

FOR EVERY 1,000 LOW-INCOME COMMUTERS	BASE CASE	$2 SURCHARGE NO FREE PARKING
Transit Rider	778	862
Auto Passenger	70	45
Auto Driver	152	93
FOR EVERY 1,000 MEDIUM-INCOME COMMUTERS		
Transit Rider	593	710
Auto Passenger	123	90
Auto Driver	284	200
FOR EVERY 1,000 HIGH-INCOME COMMUTERS		
Transit Rider	452	547
Auto Passenger	148	124
Auto Driver	400	329

TABLE 8

IMPACT OF PARKING PRICING PROGRAMS ON DAILY HOME-TO-WORK TRANSIT TRIPS

Home-to-Work Transit Destinations

To Area	1968	1977 Base Case	Implement Commercial Rates	Implement New Rates Plus $1 Surcharge	Implement New Rates Plus $2 Surcharge	Percentage Change From 1977 Base
Ring 0	66,000	111,000	116,500	124,000	130,000	+17
Capitol Hill	2,500	4,500	5,500	6,000	6,500	+44
SW Mall	8,000	20,000	23,000	24,500	26,000	+27
Pentagon	5,500	9,500	13,000	14,000	14,500	+54
Rosslyn	1,000	7,000	7,500	8,000	8,500	+26
Remainder Ring 1	20,500	28,500	31,500	34,000	36,000	+26
Silver Spring	2,500	5,000	5,500	6,500	7,000	+37
TOTAL	106,000	185,500	202,500	217,000	228,500	+23

Low income drivers who continue to use their cars for commuting after the implementation of parking programs probably have no viable transit alternative. High-cost parking strategies represent a substantial financial burden on these drivers, which could be alleviated by allowing low income drivers to claim a parking tax deduction, or by designing special transit or para-transit services to serve their trip needs.

Drivers switching to transit because of parking disincentives will have less convenient home-to-work trips, if their work trips cannot be served by high speed metrorail or bus priority service. Two additional problems are the potential limitation of work hours caused by inconvenient transit schedules, and the elimination of necessary stops at intermediate destinations normally served by the home-to-work or work-to-home auto trip. COG's 1968 home interview survey shows that over one-fifth of all commuters did not travel directly between home and work. Essential intermediate destinations include:

- taking children to day care centers and other child care facilities
- educational opportunities
- personal business
- shopping
- recreation and social

Elimination of work-based auto trips involving intermediate destinations could have far-reaching negative social consequences. Exemptions from parking programs for low-income citizens, working mothers, students and other groups would be administratively unwieldy and involve potential abuse. However, if effective compensatory transportation opportunities are not available, the life style and employment opportunities of these groups would suffer disproportionately.

Table 8 shows the projected impact of parking pricing programs on transit home-to-work patronage. The 1977 base case patronage totals include the prior impacts of transit improvements. 1968 transit levels are provided for reference.

Parking programs 1-3 will increase home-to-work transit patronage by approximately 43,000 passengers per week day. This will necessitate expansion of the transit system beyond its 1977 base case level. The number of additional buses needed will be minimized to the extent that buses can be used to feed rapid rail stations, or run from fringe parking lots to the core on priority lanes. A staggered work hours program would also reduce the requirement for additional buses. Depending on the route configurations and spreading of the a.m. peak period, via staggered work hours, it is estimated 200-300 additional 50-seat transit buses

will need to be acquired. In addition, smaller vehicles could be acquired for demand-response services for special transportation needs, including those of the elderly and handicapped. The capital costs for the estimated addition of 200-300 buses would range between $14-$21 million. Bus fleet expansion of the magnitude consistent with parking program implementation is currently not planned for a 1977 time frame, and would be difficult to achieve.

Balancing the fiscal impacts of the needed expansion of the transit system, would be the net-income generated by a $2 per day parking tax. $32 million per year is projected for a $2 tax and $18 million for a $1 tax. These revenues could be applied to transit operations. It is estimated the additional transit passengers would add approximately $4 million per year to the current operating deficit, at present fare levels.

COMMERCIAL PARKING INDUSTRY

The 1974 inventory for the downtown core (Ring 0) contained 50,800 spaces in commercial and monthly permit lots and garages in Ring 0. 1977 base case projections show 50,500 commuter auto driver trips to Ring 0. If it is assumed that government and free private parking facilities remain at close to capacity levels in the base case, only 34,000 commuter drivers are left to occupy the 50,600 commercial/monthly permit spaces.

The commercial/monthly permit auto driver market would not be substantially affected by the imposition of average commercial rates on free and low-cost long-term parking since government and private facilities would bear the brunt of this reduction. However, the implementation of a $2 increase in costs (surcharge or rate regulation) would decrease the number of commuter auto drivers available to commercial/permit facilities to 28,000.

A negative revenue impact on the commercial parking industry can thus be expected; this impact will result in the following actions:

- the industry will make an effort to attaact short-term parkers via alterations in short-term rates, and other marketing programs.

- a number of commercial facilities, in order to cut operating costs, will convert from attendant facilities to self-park facilities. This will result in the loss of some attendent jobs.

- a number of off-street commercial parking facilities will close.

REGIONAL LAND USE AND EMPLOYMENT PATTERNS

To the extent that parking programs create substantial inconveniences for core businesses and their employees, there will be pressures to relocate outside of the parking program areas. Parking programs will potentially have negative impacts on employment levels, land values, and land development in affected areas. This potential will be influenced by growth policies in areas not having parking programs. If extensive relocation develops over time, vehicle miles of travel could grow substantially in outlying areas and erode regional air quality levels.

This potentially serious problem can be addressed by lowering the standard for transit adequacy. If a lower adequacy standard is accepted, many suburban areas would become candidates for parking programs. A wider geographical scale for parking programs would help counter pressures for relocation of economic activity, and would result in lower parking taxes or space restrictions in the regional core.

Auto Control Zones

Auto control zones are a family of techniques whereby the movements of motor vehicles through or into selected urban core areas are restricted. A typical form of an auto control zone in the United States has been the pedestrian mall. This technique often involves the reconstruction of downtown streets into "people-oriented" streets with the total or partial restriction of cars. Auto control zones may also take the form of traffic channelization techniques which create "super-blocks" in terms of traffic flow. Finally, techniques can be implemented which prohibit through traffic on streets via mandatory turns and intersection redesign.

Auto control zones, if carefully designed and implemented in conjunction with complimentary transportation control strategies, have the potential to achieve improved localized and regional air quality. Localized carbon monoxide pollution levels in the immediate area of the zone are subject to substantial improvement through the divergence of auto trips to other routes or to transit. In addition, people-oriented zones encourage pedestrian trips for short journeys which previously may have been made by auto. Th provision of minibus, shopper-oriented, service within and to the zone further diminishes the need for an auto for zone centered trips.

The impacts of an auto control zone without auxiliary transportation control techniques on regional hydrocarbon emissions will be minimal. In the absence of complementary transit improvement and parking programs, commuter and through auto trips will tend to divert to other routes without a regional loss in VMT. In order to have an impact on regional HC pollution levels auto control zones must act as a restraint on long-term commuter parking and encourage the conversion of core-oriented and through auto trips to public transportation. Traffic engineering improvements to efficiently handle diverted through trips not conveniently served by transit are also important.

In this study, research was concentrated on the impacts and implementation issues related to the creation of an auto-

control zone in the F-G Streets retail core of downtown Washington. Intensive planning efforts for an F-G Streets mall have been underway for fourteen years beginning with the Sketch Plan for Downtown Washington in 1961. The central theme of these planning efforts has been the removal of automobile traffic from F and G Streets between 5th and 15th Streets (see Figure 6). Depending on the specific proposal, varying amounts of transit service and goods delivery restrictions were planned for the auto control area.

PLANNING HISTORY

Significant planning documents and implementation steps in the fourteen-year period are as follows:

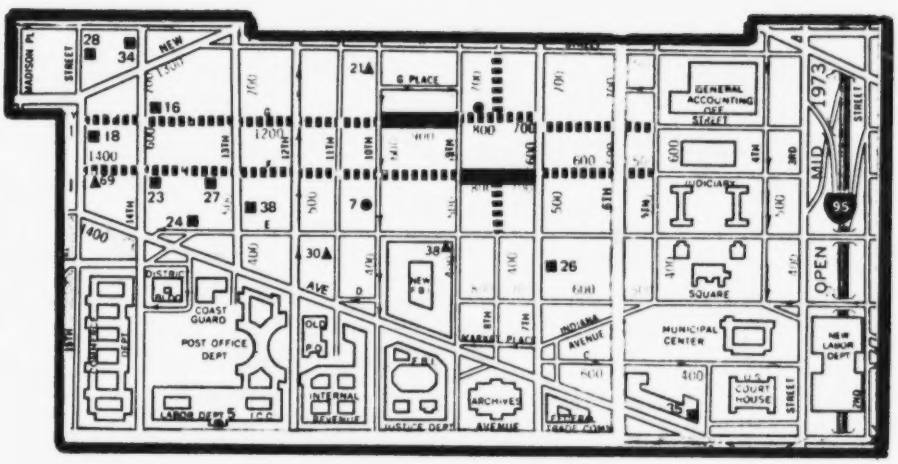
1961 - "Sketch Plan for Downtown Washington"
1962 - "Action Plan for Downtown Washington"
1963 - "Downtown Streets and Places"
1963-1971 - Operation of Minibus Service
1963 - "Facilities for Goods and Service Vehicles Study"
1966 - "F Street Plaza implemented between 12th and 14th Streets"
1969 - "Urban Renewal Plan for the Downtown Urban Renewal Area"
1970 - "Go Downtown Program" - a temporary auto control zone on F Street which lasted for 13 Thursday evenings
1971 - "Traffic-Free Zones for our Nation's Capitol"
1971 - "Design and Development Program - Downtown Washington"
1972 - "Action Plan for Early Improvements in the Transportation System"
1972 - present - Operation of Midibus service
1972 - present - Streets for People Program

These continuing planning efforts have helped initiate the present construction of pedestrian malls on F street between 9th Street and 7th Street and G Street between 9th Street and 10th Street. Upon completion in 1976, automobiles will be prohibited from these blocks and a small auto control zone in a pedestrian mall format will be in existence.

AIR QUALITY EFFECTS

Local CO pollution levels on these blocks, and as the mall is extended, for other blocks of F and G Streets, are expected to be reduced by 50%-75%, depending on the time of day and climatic conditions. This expectation is based on the impact on CO pollution observed in other American and foreign cities which have implemented pedestrian malls. However, the improvements in regional HC and CO pollution are expected to be minimal. This finding may be attributed to two factors: access to long-term parking will not be restricted by the malls, and the small vehicular volumes currently using these streets can be diverted to other streets with a minimum of inconvenience. METRO construction has been underway in this area since 1972, and automobile traffic has already been substantially re-routed.

FIGURE 6: F AND G STREETS AUTO CONTROL ZONE



BLOCKS UNDER CONSTRUCTION
(initial phase of zone)

FUTURE EXTENSIONS

Note: The entire area shown is the larger auto control examined by the study. It contains 19,000 parking spaces.

INSTITUTIONAL AND IMPLEMENTATION PROBLEMS

Institutional problems which may hinder the implementation of a larger F-G Streets auto control zone center on achieving adequate political and financial support from the local and Federal governments and from the local business community. The fourteen year planning period preceeding present construction activity testifies to the difficulty of gaining such support. Lack of continuing commitment from merchants was one of the factors which caused the demise of the temporary F Street Thursday Night Mall in 1970. However, it has been recognized by planners that "half-way" or temporary auto control zones techniques are not likely to be successful. To gain broad-based and community support, such zones must be part of an overall development plan for an area. The current F-G Streets People Street concept, plans and construction fulfill this requirement. The detailed implementation efforts for the F-G Street pedestrian mall have involved three rounds of meetings with representatives of 58 community, business, and professional organizations. This type of intense community participation in the planning process has a proven record of success in developing support for auto control zones.

A number of administrative problems can be expected, but the experience in Washington and other cities demonstrate they are surmountable for zones of the size contemplated for F-G Streets. Coordination with transit improvements will be achieved by the operation of midibus service in the F-G Streets mall and the provision of two METRO rapid rail routes to be available by February 1977. Access to existing parking spaces could be provided by entrances from adjacent streets or by short access lanes. The conversion of some parking spaces to short-term only status serving shoppers and tourists is desirable, but will encounter the administrative problems discussed for parking supply restrictions.

The creation of a special-purpose agency to perform the function of providing short-term parking in conjunction with an F-G Streets mall should be considered. This type of parking would complement the core retail area revitalization theme. There are no current plans for such an agency and program, but this study has concluded that such a program would have a significant positive effect over a five-to-ten year time frame. Such an approach would create a unified auto control zone-parking supply program for the retail core and have the potential to improve regional air quality. Short-term parking programs, 1976-78, would eventually be replaced in appropriate areas by combination programs of this nature. This would create a balance between pricing and supply restriction parking program in a 1982 time frame.

Administration of an auto control zone extends to many functions beyond those encountered in a parking program. In the case of an F-G Streets zone, a financial mechanism must be established to provide for maintenance and service functions, as well as future construction requirements. The establishment of a special assessment district and additional Federal funding for construction, are promising solutions.

In order to enhance the viability of the zone, the administration must be concerned with design and construction of pedestrian facilities, street furniture, and social/cultural activities. Maintenance and public security programs are also important to the success of the zone.

In summary, an auto control zone of the type envisioned for the F-G Streets area is a more complex technique from an administrative perspective than the parking programs previously discussed. Paradoxically, the initial phases of such a zone could have little impact on long-term parking and thus are not subject to the implementation/legal/socio-economic problems of long-term parking programs. Over the appropriate time frame, such a zone has the potential to be complemented by parking program with substantially mitigated negative impacts. This situation would occur because the presence of the modest auto control zone over time would alter the character of the area to a less auto-oriented environment, more dependant on transit service for its vitality. The application of complementary parking programs would thus be less abrasive politically, and in terms of socio-economic impacts.

SOCIAL/ECONOMIC EFFECTS

This study has concluded that the socio-economic impacts of an F-G Streets auto control zone are primarily positive. Experience with properly planned malls in other cities has shown a strong trend toward increased retail sales. In addition, the absence of a large initial impact on parking supply will minimize the negative cost and convenience problems associated with alternative parking programs. The expanded transit services for the auto control zone will have a tendency to alter parking patterns over time via incentives rather than disincentives. Similarly, the creation of a more functional and attractive commercial environment in the core will tend to reinforce land values and employment levels, minimizing the potential for business to relocate in suburban areas because of parking programs.

The diversion of the modest traffic volumes, between 3,000 to 9,000 vehicles per 24 hour period per block, presently carried on F and G Streets should not cause serious congestion problems on other downtown streets.

Surveys have shown that some stores on F and G Streets may have as many as four to five small shipments per day arriving during business hours. Since access to some of these stores is not feasible in the near future from alternate streets or alleys, goods delivery vehicles should be permitted in an F-G Streets auto control zone until alternate access facilities such as an expanded alley network can be developed. Their hours of delivery, however, could be regulated in conformity with the overall needs and character of the zone.

This study has determined that an expanded F-G Streets auto control zone should be implemented in the retail core. Its immediate impact on regional hydrocarbon air pollution would be minimal, but its potential for long term impact is very promising. Parking supply programs which would have significant implementation problems in 1977 would be a complementary assist to an evolving and expanding auto control zone in a 1980's time frame.

LARGE AUTO CONTROL ZONES

This study also examined the characteristics of an auto control zone large enough to have regional air quality impacts in a 1977 time frame. The zone was bounded by H Street, 3rd Street, Constitution Avenue, and 15th Street, an area of 0.8 square miles (see Figure 6).

Approximately 19,000 parking spaces are contained in this zone. If all of these spaces were to be restricted long-term parking, a 0.35 ton 6 a.m.-9 a.m. HC emissions reduction would occur, and the scope of parking programs in the remainder of the core could be more modest.

However, the implementation of a zone of this size in 1977 would face complex problems, including:

- Depending on the nature of internal automobile restrictions, access to short-term parking spaces could be impeded.

- Some through trips would be diverted to alternate routes causing potential congestion problems. In addition, longer through trips could erode air quality gains of the zone in the absence of adequate traffic engineering programs. In 1973, 213,000 autos entered the zone on a daily basis.

- Congestion and air quality impacts would be minimized by the compact nature of the zone and the provision of limited arterial capacity through the zone.

- A zone of this size would entail a major redevelopment program with implementation and administration problems far more complex than those encountered in either parking programs or more modest auto control zones. Implementation costs, including street redesign, could easily exceed $50 million.

A logical and efficient approach would be initially to implement a smaller auto control zone. Over time, this zone would gradually expand, and parking programs would be instituted as required. The creation of a parking authority could be part of this growth process.

In summary, this study has concluded that a combination of an auto control zone or zones and parking management programs over a suitable period of time promises to be of significant value in improving air quality. This coordinated approach promises to have less negative impacts than the implementation of parking programs not coordinated with auto control zones.

As this interrelationship of auto control zones and parking programs matured, it is anticipated less emphasis would be placed on parking programs involving a parking tax for long term parking.